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CONTENTS

The contest for shop kinks, which closed last Saturday, brought a generous response from railway shops in all parts of the country and in Canada. Approximately 50 kinks were submitted in competition, and the ultimate choice lay between shops located in Kansas, New Mexico, Pennsylvania and California. The first prize, of $50, has been awarded to D. P. Kellogg, master mechanic of the Southern Pacific Company at Los Angeles, Cal. The second prize, of $25, has been awarded to C. J. Drury, general roundhouse foreman of the Atchison, Topeka & Santa Fe at Albuquerque, New Mexico. Honorable mention is also made of the collection submitted by E. J. McKernan, supervisor of tools in the Topeka shops of the Atchison, Topeka & Santa Fe. In awarding these prizes the judges were perplexed not only by the general excellence of the work submitted, but by the fact that they were comparing devices totally different in their nature. The award was made with care and with the best judgment possible. Almost all the kinks submitted in competition were worthy of publication, and as the competition was arranged at comparatively short notice, and as a great bulk of blueprints arrived at our office during the last week, we were forced to adopt the method of turning them into our drawing room as fast as they came to hand. The collection of kinks which won the first prize was among the last to arrive, and cannot be shown until our issue of November 5, when the kinks will next appear. We shall devote a substantial part of that issue to the exhibit. This week we are able to show the second prize and the honorable mention collections, together with a number of other kinks well worthy of publication, although no prize was awarded them. One of our contributors makes a very interesting comment on the general subject of these devices for producing shop efficiency. He says in substance that the man of the "kinks" has been the significant factor in placing the modern machine plant where it now is, and he asks how much this man has made out of it. It is doubtless true, as our contributor says, that thousands of able machinists have brought to light valuable and brilliant devices for producing shop efficiency, only to have them appropriated by the boss, and sometimes the very fact of this inventive spirit has aroused jealousy and has resulted in the loss of the inventor's job. Our correspondent believes that there are workmen in almost all machine shops to-day who could find ways of saving the management from $10,000 to $50,000 a year if they felt they would receive proper appreciation and credit for their work. This is a matter worthy of careful attention. The *Railroad Age Gazette* intends to co-operate in the work by making a special feature of these devices and by giving credit in each case where credit is due.

Railways which have succeeded in carrying passengers for a year without killing any of them should be modest in stating the fact; the Erie reports that it has maintained this record of safety for five years. During this time the number of passengers carried, multiplied by the number of miles which they have traveled, produces the very respectable figure of three and three-fourths billions. During this time the mileage of passenger trains was 50 millions. We would offer only the most friendly congratulations to the numerous roads which have lately been able to boast of their safety records, but really, it is becoming difficult to invent a sufficient variety of phrases to fit the differing conditions. It is harder than trying to be hospitable, in the same breath, to an English and a German admiral. Here is the Central Vermont, for instance, reporting 7½ years' immunity; but then the C. V. carried only ten or a dozen millions of passengers, making the total passenger mileage a beggarly 300 millions, or thereabouts, a figure not to be mentioned in comparison with the Erie's. Again, there are two sides to everything. The *Rutland News*, commenting on this 7½ years' record, says:

> The Central Vermont has the enviable record of not having killed a passenger in 7½ years. This railway company has, through its poor train service, broken many a heart and caused an infinite amount of profanity on the part of its patrons, but all that doesn't count in an indictment against it in the mortality column. There is no record of Central Vermont trains ever running down anybody by reason of their excessive speed.

Who shall say that it would not have been better to sacrifice a few lives to save those myriads of damaged hearts and tempers? Seriously, though, why should moderation in speed be despised? Nothing is plainer than that many derailments and collisions have been due mainly to running trains at higher speed than the track or the facilities were fitted for; nor that many notable records of immunity from disaster have been the result of consistent cautiousness on the part of railway managers who had the courage to refrain from competing with better-equipped neighbors. This is not the whole story, of course; but it is an element that ought to receive more attention than it does.

The trouble, apparently, with this Vermont opinion, as well as with many comments on railway accidents, is that the complicated nature of the question of safety on railways dis-

courages the commentators. The highest safety is the product of a great many safeguards, long continued and costly. The railways of Great Britain, in the year 1908, repeated their notable record of 1901 by going through the year without killing a passenger in a train accident (*Railroad Age Gazette*, May 7, 1909, page 999). A typical American comment on this record is that of the *Cleveland Plain Dealer*, as follows:

> During the year 1908 not one passenger was killed or injured on British railways. This remarkable record is certainly one of which the British railroader may feel justly proud. After contemplation of such a report the natural inclination is to make an unfavorable comparison of the railways of the United States. The current year has not been marked by many disastrous wrecks, but the two or three years preceding were periods of destruction. . . . In 1908 official reports show that 610 passengers were killed. The death list, including passengers and all others, totaled over 11,000, while the total of injured was over 111,000.[1] Of course the vastly greater mileage of American railways is in large degree accountable for the tremendous difference between the British and American figures. But this does not suffice to explain everything.[2] America has gone speed mad, and the railways are affected and afflicted.[3] There are express trains in Great Britain that make good time, but they do not sacrifice everything to this one end. Safety and sanity are observed in carrying passengers and freight.[4] The figures of railway casualties for 1909 in America will show that this country is coming to a realization of the needlessness of such slaughter. Railway officials, moved by the indignant public clamor of a year or two ago, have inaugurated a better policy, and have materially reduced the chances of death on the passenger cars.[5]

The first point to be noted is that the first statement is not true; 102 passengers were killed; it was in one class of casualties, those due to train accidents, that the passenger death record was nil. But even had this proviso been noted the statement would still be wrong, for it was freedom from deaths of passengers, not from deaths and injuries, that was the remarkable feature of the train-accident record. This was, indeed, remarkable, and we do not belittle the fact; we are only asking for more careful statement. The enormous figures of the American record (see clause marked 1) must be reduced several times before comparing fairly with the English record that is quoted. (Our own record is disgraceful even then). Why compare mileage of road (clause 2)? Much of our mileage has such light traffic that comparisons on that basis are absurd in the extreme. Again, to say that American railways are speed mad (clause 3) only befogs the subject, for the great majority of our worst train accidents occur to trains running at ordinary speeds, while our very fast trains are among the safest in the country. Our English cousins are indeed "sane" in their safeguards against train accidents (clause 4), but we must not imply that they are "slow," for they run more fast trains than we do. It is, probably, true that American railway officers have within the past two years reduced the chances of death on passenger cars (clause 5); but of definite evidence to support this assertion our contemporary seems to have none at all. The chances of death in any given train have been reduced by the diminution in the total number of trains, passenger and freight; but what about the increase with the increase in trains? The growing accident records of the past two months illustrate this last-mentioned aspect of this element. In so far as the use of the block system has been extended a definite improvement has been made in the safety of life and limb on American railways; but aside from that, a careful study is necessary to show progress. We do not deny progress; but let us be accurate. Finally, why set such store by statistics? We all know what needs to be done to make travel safer; why not do it?

CONTRACT REPAIRS TO LOCOMOTIVES.

We print this week an interesting letter on repairing locomotives by contract rather than in the home shops. From other writers we have at hand a number of important conclusions on this subject, all of them in favor of home repairs, which may be summarized as follows:

(1) It is advisable for a railway to make heavy repairs to its locomotives in its own shops wherever this is possible, because the fact of these repairs enables the railway, without loss, to own a higher grade of shop facilities and equipment than would be commercially possible if heavy repairs were not made. This is of advantage in all branches of the mechanical work.

(2) Home repairs enable the railway constantly to have under employment a greater number of skilled mechanics.

(3) They enable the master mechanics, because of the increasing volume of work done in the shops, to specialize or to individualize thoroughly each particular operation.

(4) Engines repaired in the home shops have to their credit the personal interest of the employees working on them. This ought to include the interest of the locomotive engineer, though this latter interest, because of trade unionism, has been almost entirely lost.

(5) Heavy freight charges in getting the engine to and from the contract shop are saved, since a railway shop properly located will be at the center of gravity of engine mileage on the line.

(6) The railway company usually makes some little gain in the purchase of its specialties if it repairs in its own shops. This is demonstrated by the fact that when new locomotives are contracted for, the specialties are almost always provided by the railway company.

(7) If the railway shop can be organized as well as the contract shop, the percentage profit accruing to the contract shop can be saved.

(8) Operating officers have better control of power when the repairs are made in their own shops.

(9) The importance of the railways in the community is directly affected by the number of employees located there, and if the employees are loyal to the property, this influence is of great value.

(10) The greater volume of work done in the railway shop enables the overhead charges to be reduced per unit of work.

(11) A good many conditions arise in operating locomotives, a knowledge of which in making repairs is valuable, not only to the mechanical officers, but to the mechanic as well. Such information can be given to the contracting firm, but it is seldom sufficient in detail.

(12) A contract shop has no interest in reapplying old parts instead of using new ones.

(13) Mechanics well understand that their responsibility ceases in great measure when the engine leaves the works to go into service on the road. Thus considerable material finds its way to the scrap pile uncredited, in spite of careful inspection. This directly affects the amount of stock carried by a railway company.

(14) Locomotive builders are not equipped with the organization familiar with repair work, and the shop is not always arranged to the best advantage for it, since both shop and organization are designed to build rather than to repair locomotives. Consequently, they cannot be expected to repair them as economically as in a shop where the organization is designed for repair work and is engaged in it continuously.

On the other side of the case is the likelihood that the contract shop will have facilities materially better than those of the small railway, and will do a job which will be more permanent, and hence cheaper. Moreover, the important question of indirect, or overhead costs, often receives scant consideration in the railway shop, and the expense of certain operations is often figured too low, in consequence.

Assume the following data:

The A. B. & C. Railroad has 400 locomotives, and the total annual repair cost is $1,000,000, of which $500,000 is spent on heavy repairs and $500,000 on light and running repairs.

Assume that a shop to handle locomotive repairs and also freight and passenger car repairs can be built and equipped for 1¾ times, the cost of annual locomotive repairs.

Comparative costs would then work out as follows:

Home.		*Contract.*	
Annual cost, $1,750,000, at 5 per cent.....	$87,500	Annual cost of $875,000 to railway company for home shops needed for running repairs ..	$43,750
Taxes, depreciation on building and tools, at 10 per cent.....	175,000	Ditto, to contract shop for heavy repairs	43,750
Labor, materials and superintendence.	1,000,000	Taxes, depreciation, etc., home shops.	87,500
	$1,262,500	Ditto, contract shops...	87,500
		Labor, materials and superintendence, home shops.	500,000
		Ditto, contract shops ..	500,000
		Contractor's profit, 10 per cent. on $500,000.	50,000
			$1,312,500
		Add freight on locomotives.	

As a matter of fact, however, the actual comparison would probably look more like this:

Home.		*Contract.*	
Annual cost of $1,400,000 (balance allocated to car repair account)	$70,000	Home running repairs: Annual cost of $700,000.	$35,000
Taxes and depreciation.	175,000	Taxes & depreciation.	87,500
Labor, materials and superintendence	1,000,000	Labor, materials and superintendence ...	500,000
	$1,245,000		$622,500
		Heavy repairs at contract shop: Materials	$225,000
		Labor and superintendence	250,000
		Contractor's overhead charges (at 67 per cent. of labor).....	167,500
		Contractor's profit ...	47,500
			$690,000
		Total	$1,312,500
		Add freight for locomotives.	

In the foregoing table, the assumption was made that the contract shops on account of their great size and excellent equipment, would be able to effect a saving of 10 per cent. in the cost of materials, as compared with the large railway shop. If the same comparison be made in the case of a small railway shop, badly equipped, the saving should be much greater, and should apply to labor and superintendence as well: For example:

Home. X. & Y. R.R., 10 locomotives.		*Contract.*	
Repairs at $2,000 = $20,000.		Home running repairs = ½ total. Annual cost, $15,000 at 6 per cent.....	$900
Necessary shop equipment would cost about $30,000.		Taxes & depreciation..	1,500
Annual cost of money at 6 per cent.....	$1,800	Labor and superintendence	6,000
Taxes and depreciation.	3,000	Materials	4,000
Labor and superintendence.	12,000		$12,400
Materials.	8,000	Heavy repairs at contract shop, ½ total: Labor and superintendence	$5,000
	$24,800	Materials	3,000
		Contractor's overhead charge, say 70 per cent. of labor.....	3,500
		Contractor's profit. ..	800
			$12,300
		Total	$24,700
		Add freight for locomotives.	

The last table assumes labor and superintendence at five-eighths of the total direct cost, and materials at three-eighths, but if the locomotives are rebuilt or the repairs are unusually heavy, these figures may easily be reversed. In that case, the contract shop, owing to its ability to get materials and to obtain a high grade of superintendence more economically than is possible in the case of a small railway shop, can work at a distinct advantage.

It will be observed that the contractor's overhead charge is usually figured at a certain fairly high percentage of the total labor rather than as a percentage of the cost of the contractor's shop and equipment. This is necessary in a contract shop because the same lands, buildings and machine tools perform work for a variety of customers, and the labor charge affords the easiest and substantially the only accurate way of prorating these indirect and intangible costs. The difference with the kind of accounting usually done by railway mechanical departments is that it does not take these intangible charges carefully into account. The road has to have shop equipment of some kind; the limits of the economic utility of this equipment are not usually figured out in a very scientific manner. Thus it frequently happens that railway shops devote much time and money to turning out certain specialties at a cost price which the master mechanic or the superintendent of locomotive power believes to be low, whereas if the overhead charges were properly applied it would at once be apparent that the cost price was prohibitive.

There is much about this subject that is intangible because of the railway's need for a certain amount of shop and roundhouse facilities in any case, in order to care for the rolling stock and to make running repairs. In England, where distances are small and individualization of railway shops is carried to an extreme, it is obvious to the outside observer that wrong methods of accounting are used habitually; that the railway mechanical departments have very little idea what they are spending, and could save a good deal of money if they would not attempt to do all their own work. In this country, where distances are great and freight costs are a serious factor, the situation is far less serious, especially since it is the practice of most of the large railways and substantially all of the small ones to buy their equipment, instead of making it themselves. But the fact remains that an intelligent and thorough system of charging against a mechanical shop all the costs actually pertaining to it would disclose that much work is being done in railway shops which ought to be done outside.

PERE MARQUETTE.

The fiscal year ended June 30, 1909, was the first complete year of operation of the Pere Marquette since the discharge of the receiver. The Cincinnati, Hamilton & Dayton and the Pere Marquette leased by it went into receivership together on December 4, 1905. The lease was canceled and the properties were operated separately by the receiver. In December, 1907, the Pere Marquette Railroad Co. took over the property and assumed the liabilities of the old Pere Marquette Railroad Co. and the Pere Marquette Railroad Co. of Indiana and the receivership was then brought to a close.

The property lies largely in the state of Michigan and forms a comparatively short route across the state from Ludington, about half way up the east coast of Lake Michigan, to the lower end of Lake Huron, there entering Canada and going by way of St. Thomas to Buffalo. There is also a north and south line connecting Chicago with the ports at the northern end of Lake Michigan. This is a first class position for a road, and the receivership in 1905 was the result of causes other than the geographical location of the property.

Previous to the appointment of a receiver, quite inadequate sums had been spent for maintenance of way and equipment, with the exception, possibly, of expenditures for repairs of locomotives, and it was necessary for the receiver to first spend considerable sums for equipment and betterments before it was possible to handle the traffic that the road was in a geographical position to develop.

Last year the company was able to so well take advantage of the improvements made by the receiver that it showed a surplus of $41,000 after paying interest and rentals, as against a deficit in 1908 of $394,000. This result is due both to larger gross earnings and to very decided economy in operation.

Gross earnings were $14,600,000 in 1909 and $13,750,000 in 1908. With this increase of $80,000 in earnings operating expenses only increased by $36,000, being $10,580,000 in 1909.

The greater part of the increase in gross is accounted for by freight revenue, greater by $680,000 in 1909 than in 1908. There were 1,680,000,000 tons of freight carried one mile in 1909 as against 1,500,000,000 carried in 1908. The earnings from this freight in 1909 amounted to $9,700,000 as against $9,020,000 in 1909. The average revenue per ton per mile was

0.577 cents in 1909 and 0.602 cents in 1908. The average length of haul was 180 miles last year and 169 miles in the previous year, and the average trainload was 307 tons last year as against 288 tons.

In September, 1907, the Michigan legislature passed a two-cent fare law. The receiver decided to accept the law without protest to the courts and try out fairly whether the extra traffic developed by low rates would make up for the decrease in the receipts per passenger per mile. The results in 1908 and 1909 do not show that passenger traffic was increased to any great extent by this reduction in rates. The average increase in the number of passengers carried one mile in the 10 years from 1900 to 1909 was 6.85 per cent., while the increase in 1908, the first full year in which the low rate was in effect, was 6.70 per cent. and the increase last year was 6.44 per cent. It is estimated that if the 1907 average passenger rate of 1.972 cents per passenger per mile could have been charged in 1909 it would have added about $375,000 to net earnings.

Total operating expenses in 1909 were $10,600,000 and in 1908 were $10,580,000. The cost of conducting transportation in 1909 was $5,700,000 against $5,800,000 in the previous year. This saving reduced the ratio of transportation expenses to gross earnings from 42.14 per cent. to 39.05 per cent. The saving was very evenly distributed among the various accounts, fuel and labor both costing less last year than the year before. The unit costs of maintenance are given in the following table:

	1909.	1908.
*Maintenance of way	$517	$593
Repairs per locomotive	2,113	2,044
" " passenger-train car	492	429
" " freight-train car	38	38

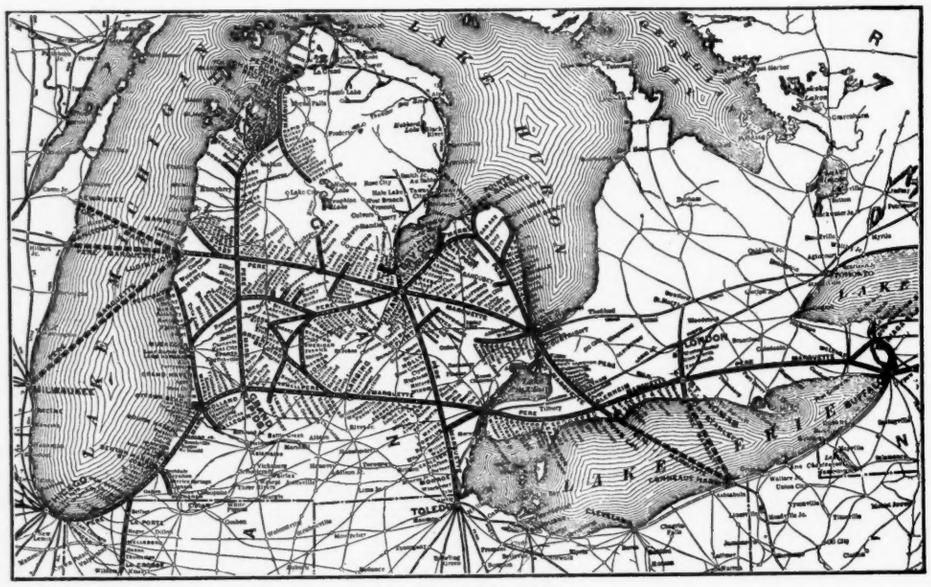
*Per mile of first, second, etc., track operated (two miles of sidings and switch tracks being counted equal to one mile of main track).

These expenses for the up-keep of the property are, with the exception of the cost of repairs of locomotives, unduly small. Thirty-eight dollars is not an adequate sum to spend on a year's repairs of a freight car, and $517 is a low figure for maintenance of a mile of track.

The fact of the matter seems to be that the Pere Marquette is much in need of money. The company had cash on hand of $270,000 on June 30, 1909. This compares with $800,000 cash in June, 1908. Total current assets were $2,900,000 and current liabilities totaled $3,300,000 in 1909. This is an increase of only about $100,000 in assets, while liabilities increased by about $500,000, most of the increase being in bills payable. The balance sheet also shows a profit and loss debit of $1,090,000 in 1909 as compared with a debit of $641,000 in 1908.

During the year $420,000 receiver's certificates were paid off, and since June 30 the remaining $180,000 receiver's certificates have been paid. The company also decreased its funded debt by $51,000 and spent for equipment, additions and betterments on capital account $1,300,000. A little over $1,000,000 of this sum was spent for the retirement of equipment trust bonds.

The list of directors of the Pere Marquette indicates that it is still closely associated with the Cincinnati, Hamilton & Dayton, and the recent election of President Cotter, of the Pere Marquette, to the office of president of the Cincinnati, Hamilton & Dayton also shows this close relationship. It will be recalled that recently the Baltimore & Ohio bought an option on the common stock of the C., H. & D. by agreeing to guarantee certain of its securities issued under the reorganization plan. The banking interests now represented on both the board of directors of the C., H. & D. and the Pere Marquette have as a matter of fact therefore sold the C., H. & D. and apparently still have the Pere Marquette to get rid of. It seems possible that they would not be at all averse to selling out to, say, the Canadian Pacific, which last year bought control of the Wisconsin Central. The value of such a road as the Pere Marquette to the Canadian Pacific has been pointed



The Pere Marquette.

out in these columns before,* and now the report of the Pere Marquette strongly emphasizes the very great value that such a control would be to this road. One thing appears certain: either the Pere Marquette will have to do some financing on its own account—and it surely cannot do this as cheaply as could the Canadian Pacific—or it will have to be taken over by some stronger company and be provided with working capital by that stronger company.

The following table gives a comparison of the results of operation in 1909 and 1908:

	1909.	1908.
Average mileage operated	2,349	2,362
Freight revenue	$9,705,565	$9,025,916
Passenger revenue	3,366,466	3,295,704
Total operating revenue	14,629,827	13,753,982
Maint. way and structures	1,669,220	1,620,206
Maint. of equipment	2,018,494	2,044,500
Traffic	349,971	306,044
Transportation	5,712,493	5,795,436
Total operating expenses	10,581,580	10,545,988
Taxes	576,893	553,239
Net operating income	3,471,354	2,654,755
Gross corporate income	3,709,563	3,157,129
Surplus	40,651	*393,667

*Deficit.

CANADIAN PACIFIC.

In the past two years there has been great activity in transcontinental railway building, and of the various roads now under construction which will form parts of transcontinental lines, two—the Grand Trunk Pacific and the Pacific coast extension of the Chicago, Milwaukee & St. Paul—will compete directly with the Canadian Pacific. Notwithstanding this prospective competition in a field, at least in the case of the Grand Trunk Pacific, where it has previously had a monopoly, the position of the Canadian Pacific, both as a railway and as a corporation, appears as impregnable as ever. There is no

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other railway like it in the world. It runs from the Atlantic coast to the Pacific, with branches and feeders tapping a wide belt extending across the continent along the northern border of the United States. It controls lines reaching down into the United States as far as Chicago, and draws traffic from as far south as New York.

It is a road that was built with a great deal of government aid, most of the benefit of which has accrued to the company and has not been diverted by promotors and speculators, as was the case so often with government aid given to transcontinental roads in the United States. A cash subsidy of $25,000,000 was given to the C. P. R. and a land grant of 33,400,000 acres, of which it returned to the government 6,800,000 acres in 1886. All the duties on this land have now been paid, and after deducting sales up to June 30, 1909, the company owns 8,440,000 acres of agricultural land and 4,500,000 acres of land in British Columbia. The value of this land is not carried on the balance sheet at all, and its possession is merely mentioned in a foot-note. Of the net proceeds of the sale of land previous to June 30, 1909, amounting to $63,760,000, $36,200,000 has been spent on construction and on equipment, and this sum was *deducted* from the cost of property as carried on the balance sheet.

This gives some idea of the huge equities that lie behind the common stock of the Canadian Pacific. In 1908 there were 164,000 acres of land sold by the company at an average price of $9.54 per acre; in 1909 there were 376,000 acres sold at an average price of $13.52 per acre. If the company can sell the remainder of its agricultural land at the average price which it received in 1909 it will have at its disposal $114,000,000.

Besides its land the Canadian Pacific has other very large concealed equities. Acquired securities are carried at their cost price of $63,000,000. These securities include $141,000 par value of the Canada Northwest Land Co. This stock has sold at $1,100 per share. The company owns $2,000,000 par value of the common stock of the Dominion Express Co. It has been estimated that this stock is worth many times its par value. It is not surprising, therefore, that with such resources the cash position of the company is tremendously strong. In 1908 it had cash on hand amounting to $18,800,000, and in 1909 it had cash on hand amounting to $21,100,000, and in 1909 also had $4,860,000 invested temporarily in Dominion government securities. These large additions to its present assets were made in a year in which $9,200,000 was spent for additions and betterments on main line and branches and $6,350,000 spent on rolling stock, shops and machinery, besides $2,200,000 spent on additions and improvements on leased and acquired lines.

These disbursements were made possible by the receipt of $10,980,000, representing the payment of the last instalments on the $24,336,000 additional stock sold in the previous year and the sale of $3,984,000 stock last year. With such strength the competition of new lines is not to be greatly feared, and the price of the common stock, about 185 at present, reflects the confidence of investors in the future earning power of the property.

The management is not, however, relying on the strength of its financial backing to meet competition when that competition becomes fully developed. The policy, especially in the past year, has been keenly aggressive, particularly in its traffic relations with transcontinental roads in the United States. The Minneapolis, St. Paul & Sault Ste. Marie, a subsidiary United States corporation of the Canadian Pacific, bought control of the Wisconsin Central during the past year, giving the C. P. R. an entrance into Chicago and the possibilities of developing another route for its freight across the continent. Another step toward forestalling competition was the purchase of a controlling interest in the Alberta Railway & Navigation Co. for about $2,000,000. This company owns about 113 miles of railway in south Alberta, with a colliery which supplies a considerable number of settlers along the lines of the C. P. R. with coal. For a number of years this railway was operated by its owners as a close friendly connection of the C. P. R., but it was rumored that James J. Hill was making efforts to acquire control in the interests of the Great Northern, and the Canadian Pacific thought it best to make sure by themselves getting control. Moreover, the C. P. R., in connection with the Boston & Maine and the New York, New Haven & Hartford, have made a very strong bid for freight originating at New York destined for the Pacific coast and export to the East. Rates have been cut by this combination and the Trunk Line Association have been threatened, also because of the diversion of traffic from the water route going south of the United States to Pacific coast ports, with a cut in this southbound water rate, and numerous conferences were held without any as yet definitely known result.

The Canadian Pacific is particularly well able to compete against roads lying in the United States because its rates are not subject to regulation by the Interstate Commerce Commission and because it is under the protection of the Conservative party in Canada, which, although not now in office, yet has a great influence on any legislation in regard to the C. P. R.

The year ended June 30, 1909, was a prosperous one for the Canadian road. Its gross earnings amounted to $76,300,000, comparing with $71,400,000 in 1908. Operating expenses were $53,400,000 last year and $49,600,000 in the previous year. There was paid $11,107,867 dividends in 1909 and $9,217,207 dividends in 1908, leaving a surplus in 1909 of $3,800,000 and in 1908, $5,600,000. In addition to the regular dividends of 6 per cent. on the common stock, 1 per cent. additional was declared in both 1908 and 1909 from interest on land funds.

The earnings from passengers amounted to $20,200,000, only a slightly greater sum than was earned in 1908, but earnings from freight were $48,200,000 last year, as against $44,000,000 in the previous year. There were 6,370,000,000 tons of freight carried one mile in 1909 and 5,865,000,000 tons in 1908, and earnings per ton per mile were 0.76 cents in 1909 and 0.75 cents in 1908. The quantity of both wheat and manufactured articles carried increased considerably last year. There were 97,000,000 bushels of grain carried in 1909, as against 88,000,000 in 1908, and there were 4,400,000 tons of manufactured articles carried, as against 3,980,000 in 1908.

The increase in operating expenses, as noted above, was due largely to an increase in the cost of maintenance of equipment, this cost being $11,080,000 in 1909, as against $9,360,000 in 1908. Unit costs of maintenance of equipment are not given. Maintenance of way and structures remained about the same, costing $984 per mile of line in 1909 and $1,075 in 1908. The cost of conducting transportation in 1909 was $25,600,000, as against $24,100,000 in 1908.

The average trainload, which amounted to 299 tons last year, was greater by about eight tons than in the previous year. The loaded freight car mileage increased by 11 per cent., being 35,600,000 in 1909, and the empty car mileage increased by 16 per cent., being 14,700 in 1909, so that the average freight train earnings per train mile were only slightly greater in 1909 than in 1908, being $2.27 last year.

Of the many good things that the Canadian Pacific has to look forward to, probably the development of its own and adjoining lands in the northwest is the most sure to increase very largely the earnings of the company in the future. Irrigation canals and ditches in what is known as the Western Block of the C. P. R. lands are nearly finished, and it is believed that in another season most of the 995,000 acres will be occupied by settlers. This will open up an area on the main line east of Calgary containing 1,500 square miles that were previously considered unfit for agricultural purposes.

The following table gives a comparison of the results of operation in 1908 and 1909:

	1909.	1908.
Mileage worked	10,140	9,688
Freight revenue	48,118,520	44,037,598
Passenger revenue	20,153,001	19,900,432
*Total operating revenue	76,313,321	71,384,174
Maintenance of way	10,074,049	10,410,752
Maintenance of equipment	11,080,887	9,358,138
Traffic	2,123,860	1,734,087
Transportation	25,568,990	24,112,714
†Total operating expenses	53,357,748	49,591,808
Net earnings	22,955,573	21,792,366
Gross corporate income	25,262,061	24,446,999
‡Net corporate income	14,955,028	14,796,923
Dividends	11,107,867	9,217,207
Surplus	3,847,161	5,579,715

*Includes earnings from sleeping cars, express elevators, telegraph and miscellaneous.

†Includes expenses of parlor and sleeping cars, and of lake and river steamers.

‡After the deduction, in both years, of $800,000 appropriated for steamship replacement fund.

Letters to the Editor.

CONTRACT REPAIRS TO LOCOMOTIVES.

Middletown, N. Y., Sept. 10, 1909.

To the Editor of the Railroad Age Gazette:

Referring to the discussion in the *Railroad Age Gazette* as to whether it is more profitable for a railway to make heavy repairs on its engines at home or to have the work done by contract: the question depends on local conditions.

If the road is a small one and has no adequate shop facilities there is nothing else to do. If, however, the road does have well equipped shops, I think it best for a railway to repair its own engines. By having work done at the railway shops the men in charge can keep in touch with various details of parts that would need strengthening or redesigning, besides building up towns along its own road, which will help out in the amount of freight carried.

The cost of getting locomotives repaired at outside shops is always more than if the work were done at home on account of the percentage added, which runs from 60 per cent. to 100 per cent.

Where a road has shops that can take care of some of the work and the question comes up whether it would be better to spend considerable money to get enough more shop room to take care of all the power or to keep on getting some locomotives repaired outside, the matter has to be gone into very thoroughly. It is something, however, that each road will have to decide itself, as conditions such as locations of present shops, location of nearest outside shop, cost of new shops, etc., vary on different roads.

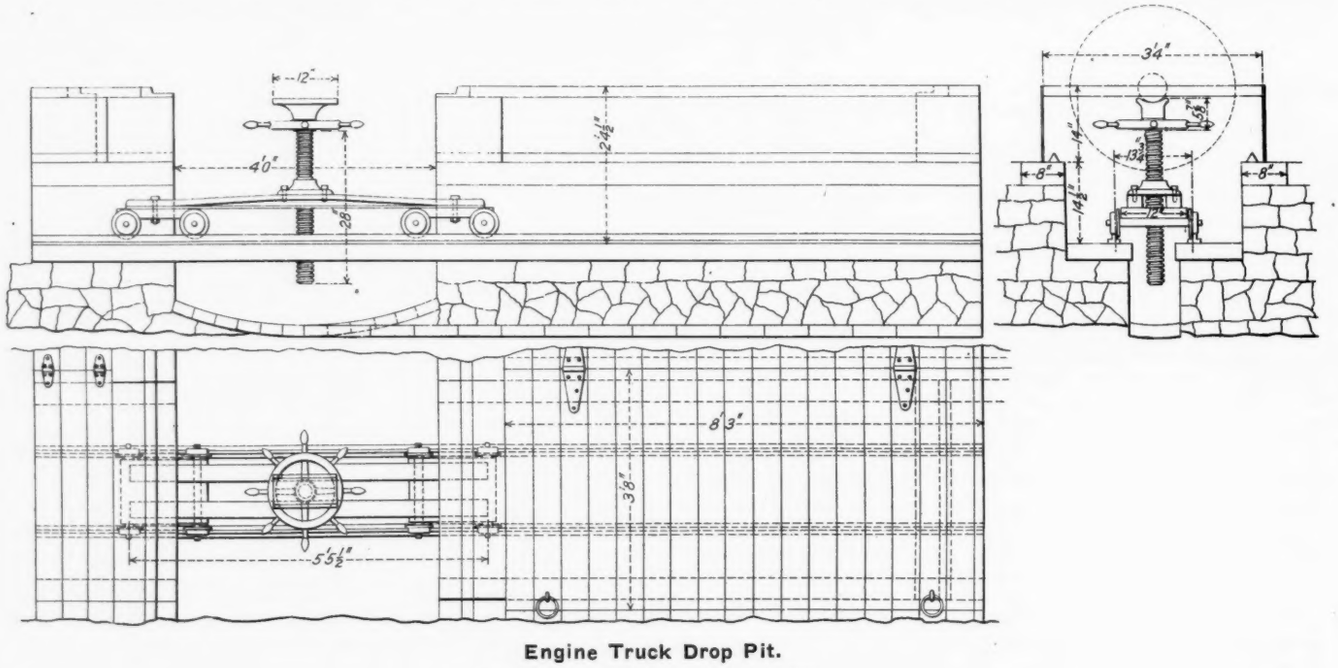
Personally, having had experience with both methods, I prefer to handle power at the railway's own expense on account of the following reasons: Being able to keep in touch with the defects in the engines; building up the towns where the shops are located; cost being less as practically the same number of officials are required on the road whether engines are sent to outside shops or not.

B. P. FLORY,
Superintendent Motive Power, N. Y., O. & W.

WHEEL DROP PIT.

To the Editor of the Railroad Age Gazette:

I beg to enclose herewith a blue print of what perhaps was the first drop pit ever invented for removing and replacing engine truck on driving wheels of a locomotive without jacking it up. The print was made in 1877 from a tracing, and the tracing was made at the time the device was constructed by me in the roundhouse of the Pennsylvania Railroad Company at Renovo, Pa. At the time I was foreman. It was designed to use a hydraulic jack for raising and lowering the wheels, but as hydraulic jacks in those days were luxuries the officers of the company thought they would be too expensive for use in that connection. I was, therefore, compelled to use a screw, as is shown in the print.



Engine Truck Drop Pit.

Designed by W. H. Thomas, in 1877.

The first trial device showed a wonderful saving of time over the old method. The helpers or laborers removed a pair of defective wheels and replaced them with a pair of good wheels in less than half an hour from the time the screw jacks were placed under the locomotive to release the weight, and again removed. The late Howard Fry was then superintendent of motive power of the Philadelphia & Erie division of the Pennsylvania. (He afterwards became superintendent of motive power of the West Shore Railway.) He was very much interested in the device and took occasion to bring several of his friends to see it in operation. He made the claim for it that it was one of the greatest labor-saving devices he knew of. In the course of a few years the device was put into

use by many of the leading railways. When compressed air came into general use, however, the screw was discarded and an air hoist used in place thereof in the pits afterwards constructed.

When on a visit to the Renovo shops a few months ago I found the old device, this original design still "doing business at the old stand." I have since learned that it has been removed to a smaller shop at another point on the line where compressed air is not available. The device was never patented by me, although some other person did get a patent on the very same, identical device many years after I had constructed the original one and put it into use.

W. H. THOMAS,
Late Superintendent of Motive Power, Southern Railway.

It will be seen that this is the old and familiar device by which a jack on a transverse track is run beneath the wheels to be removed. By raising the wheels with the axle and then removing a short section of the rail the wheel can be dropped into a pit. Then, still supported on the jack, they are run out to one side in the transverse pit, after which they are raised to the level of the shop floor. In rewheeling the operation is reversed.—EDITOR.

SYSTEMATIC SIGNALING.

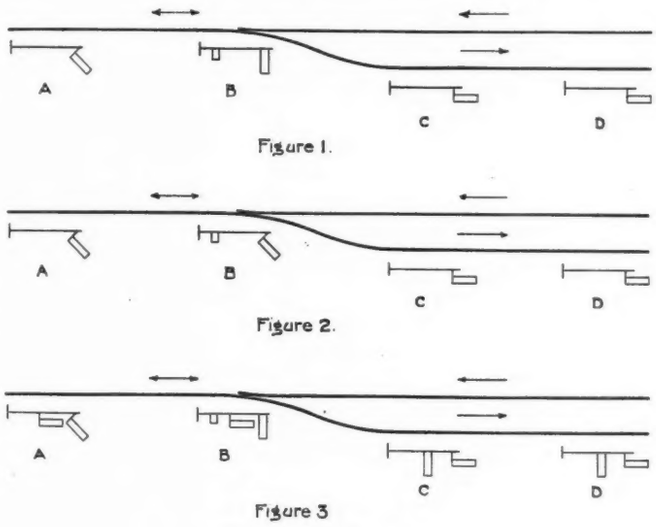
TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

Mr. Stevens' comments under the above title in your issue of September 24 bring out a fundamental difference of view as to the instructions properly to be given to enginemen by signals and the action to be taken on the several instructions. It is held [by Mr. Stevens] that the indication of any one signal should include no instructions to the engineman as to what he is to do or prepare to do at the next signal; that the engineman should read and act upon each signal as it is reached; that successive signals should, however, be so related and controlled (practically as home and distant signals are now) that one signal cannot indicate "Proceed" or "Proceed at normal speed" when the conditions or indication at the next are such as to require a reduction of speed or a stop before it is passed. That is, signals would operate just as they do now in numerous instances and would represent the same conditions but, in the wording of the indications and in the instructions or explanations to enginemen, all reference to certain conditions would be carefully suppressed and emphasis would be laid on the necessity of a blind, mechanical obedience to a few signal indications rather than on action more suited to the various conditions as represented by a greater number of more specific indications.

Apparently an engineman, upon noting a signal indicating "Proceed" or "Proceed at normal speed," should obey the indication and proceed at full speed but at the same time should exclude from his mind any idea of the indication of the next signal and be quite prepared to find that signal at Stop, although, in obedience to the first signal, making no preparation to stop before reaching it. Similarly, on the indication, "Proceed with caution," he should assume nothing as to the point at which a stop might be necessary, immediately reduce speed and proceed slowly, able to stop at any point on the clear track of an automatic block, up to the next signal where a stop might be indicated.

The proceed indications listed by the committee are based on the assumption that it is desirable and advantageous to tell enginemen more definitely what they should do under certain conditions, and that nothing is to be gained by a forced suppression of any reference to certain conditions that are perfectly well known to every engineman on the road. Every engineman knows, or can readily be made to understand, that nothing under the sun is infallible and that no one has miraculous power to insure that a signal will not be changed to Stop after a preceding signal indicating that it is clear has been passed. There is no objection to telling enginemen frankly that this is the situation; that they must watch for each signal as they approach it and do their best to stop if one unexpectedly indicates Stop, but that, barring such rare, emergency conditions, the indication, "Proceed" or "Proceed at normal speed," means that the next signal, if there is one within stopping distance, is clear, so that no preparation to stop is necessary.

The first part of indication No. 7, "Proceed (at normal speed—prepare to stop at next signal," simply means that there is no condition requiring less than normal speed at that signal; it does not necessarily mean that the fastest train may continue at normal speed for some distance beyond the signal because "the next signal is too far away to require a fast train to reduce speed at once in order to stop at next signal." This indication does, however, intentionally leave the enginemen "to their own devices to make time but still to stop at the next signal." It is not believed to be necessary or good practice arbitrarily to require the enginemen of all trains to reduce speed at once; even if this is done the train must proceed at the reduced speed to a point, depending upon the judgment of the engineman, beyond which the speed must be gradually reduced to zero before the next signal is passed.



Systematic Signaling.

If, then, the judgment and skill of the engineman must finally come into the case, it is not apparent why anything more is necessary than to tell him, at a sufficient distance, to "prepare to stop at next signal."

Evidently, "speed signaling" means different things to different people. The meaning on which the indications formulated by the committee are understood to be based, is the indication by signal of specified rates of speed which, while they must not be exceeded, may be fully maintained at least up to a succeeding signal. It is believed that there is a genuine demand for this kind of signaling to expedite the movement of trains, with due regard for safety, over turnouts and crossovers. But that interpretation will not apply when a stop may be necessary on account of a preceding train in the block or a stop signal in advance. In these cases a specified rate of speed cannot be maintained up to the stopping point nor in all cases, unless it is quite low, up to a point where the train or signal ahead can be seen. It appears, therefore, that routes furnish about the only conditions so far suggested for which speed indications as defined above are uselul; and a sharp line has been drawn between these indications and those requiring preparation to stop at a signal or short of obstruction in a block, with which no more definite instructions, particularly in terms of continuing rates of speed, can be given, and under which, as previously pointed out, the judgment and

skill of the engineman must determine the actual handling of the train in accordance with the circumstances.

The difference between the two interpretations of speed signaling may be made clearer by considering the accompanying diagrams of an end of double track where the turnout is in the route from single to double track. Leaving out of account the low-speed indication, it is assumed for the purpose of illustration that the three indications claimed by Mr. Stevens to be sufficient, would be given by the three positions of the arm. In Figs. 1 and 2 it will be seen that the one indication, "Proceed with caution" or "Proceed at reduced speed," would have to be given at A for a stop at B and for a limited speed movement at B; under the conditions shown in Fig. 2 the engineman would, therefore, always have to approach B prepared to stop. Similarly the reduced speed indication at B, on account of the turnout, would make it necessary to approach C prepared to stop. Thus signals A and B, Fig. 2, would be continually giving needlessly restrictive indications —indications representing conditions not existing at the time.

Just as signal C in all the diagrams indicates that the train may arrive at D at normal speed, so signal A, Fig. 3, indicates that it may arrive at B at limited speed and signal B indicates that there is no further restriction—that preparation to stop at C is not required. It is believed that the signaling shown by Fig. 3 is good and desirable and that the other is not only insufficient to meet the growing demand for more expeditious movement of trains but is objectionable in that it would perpetuate the bad practice of repeatedly giving signal indications that require of the enginemen greater precautions than are necessary under the conditions actually existing.

The few and simple indications suggested in the comments of Mr. Stevens may seem sufficient for the needs of most railways at the present time, but it is practically certain that they would not provide for the operating methods of some railways. It therefore seems highly desirable that the more complete list of indications, with the necessary aspects, be accepted. Even though several of them should be unused for a time on many roads, the probable extension of operating methods requiring the more specific indications should also be taken into account.

C. C. ANTHONY.

Contributed Papers.

TRANSITION LOCOMOTIVES FOR THE NORTHERN RAILWAY OF FRANCE.

The Northern Railway of France, which is practically rebuilding most of its main line to accommodate the daily increasing traffic, and is therefore obliged to await the completion of this work before it is able to run locomotives of up-to-date weight and power, has designed and built at its shops 25 four-cylinder compound locomotives of the ten-wheel type, having 69-in. drivers, which are to be used in handling the present traffic, and discarded from the main line as soon as the latter is in readiness for the new equipment now designing. As transition locomotives, they are of considerable interest.

They are required to haul trains weighing about 380 tons, making frequent stops, and their design is based on that of two previous engines used on this road; the boiler is practically a duplicate of that of the Atlantic type locomotive now in service, while the frame, motion work, wheels, etc., are taken from the existing ten-wheel locomotives, road Nos. 3,101 to 3,287, with some minor alterations which will be discussed later. The result is a locomotive having most parts perfectly interchangeable with those of the two types above referred to yet well adapted to the service required. In view of the rigid weight limitation per axle and per meter of total length, the only feasible design was that of a locomotive having an extremely light frame and light motion parts, while the greater part of the weight was absorbed by the boiler, resulting in much higher power. It was necessary, however, to use drivers having a relatively small diameter, and it has been proved experimentally that by using steam ports of large area it is possible to obtain speeds of between 65 and 70 miles per hour with a 69-in. driver; indeed, these engines are often used in the through express service in lieu of the Atlantics, and they prove quite as satisfactory as the latter except for speeds exceeding 75 miles per hour, which are attained with greater difficulty.

The salient features of this new type are, therefore, the cylinders, the ports of which have been largely increased, while diameter and stroke are not altered; the following comparison will show the dimensions of the ports:

	Atlantic.	New 10-wheel.	Increase, per cent.
H. p. ports	1.4 in. x 10.6 in.	1.4 in. x 14.0 in.	30
L. p. ports	1.6 " x 16.5 "	1.6 " x 20.5 "	24

The motion is of the Walschaerts type, as heretofore. The slides valves differ in that they are balanced, both on high and low pressure cylinders.

The boiler, which is similar, as stated before, to that of the Atlantic type locomotive, has a very deep firebox, which can be conveniently disposed of between the frames on account of the trailing truck in this type of locomotive. In the new design, however, the rear driving axle was in the way, and it was found necessary to set same farther in rear than in the previous design of ten-wheeler, thus increasing the rigid wheel base, and giving the engine more stability. The same truck as on the Atlantic type has been used.

It is needless to go into much detail, in view of the similarity between this design and the preceding ones, and the only points covered will be such appliances as are new on this type of locomotive.

In order to lighten the design as much as possible, wheel guards, runboards, etc., have been made as small as possible. The runboards are placed high above the drivers, giving the engine in general an appearance of great lightness.

Provision has been made to facilitate going under the locomotive by means of a large space left between the front and main driving axles, which gives ample room for the engineer to pass through—a highly desirable feature, as engineers often have occasion to go under the locomotive at times when no pit is available, such as in case of a breakage or other accident on the road. A small platform has been provided on the right side, placed below the regular runboard, on which the engineer can stand, and from which he has easy access to all motion work parts connected to the crank axle, and a door has been opened in the cab front on the right side giving access to the runboard, which is a feature entirely new on European locomotives.

Following are the general dimensions of the locomotive:

Grate, length	110 in.
" width	39 "
" area	30 sq. ft.
Firebox, depth (above grate) in front	75.0 in.
Friebox, depth (above grate) at rear	56.5 "
Tubes, number	126
" diameter	2¾ in.
" length between flue sheets	14 ft. 7 "
Heating surface, firebox	162 sq. ft.
" " tubes	2,200 "
" " total	2,362 "
Boiler, diameter	57 in.
Boiler pressure, per sq. in	227 lbs.
Weight, in working order	148,800 "
Weight on driving wheels	105,800 "
Light weight	135,800 "
Tractive power, compound	24,350 "
Tractive power, simple	29,460 "
Wheel base, driving	14 ft. 1 in.
" " total	27 " 9 "
" " engine and tender	53 " 10 "
Cylinders	13.8 and 21.7 x 25.2 in.
Drivers	69 "

TENDER.

The tender has some radically new features. It has been designed to relieve the fireman of a part of his work, which

is a problem that will soon have to be seriously considered. While the Nord tender can hardly be called a mechanical stoker, yet it relieves the fireman of all work incidental to bringing the fuel within reach of his shovel.

To this effect a very large bunker has been placed at front end of tender, in which the ordinary line of coal is placed. It has a bottom inclined at 45 deg., and is placed much higher than the tanks; on each side of this bunker is a large box intended for briquette fuel, which is thus readily accessible. It will be noticed that with this disposition a fresh supply of fuel is constantly furnished by the inclined bottom of the bunker, and the fireman's only work consists in feeding same to the fire.

The total fuel capacity is 6.6 tons, and the tanks can contain 6,100 gallons of water. The design of the tanks is extremely light for so large a capacity; they are merely braced inside by means of angle-irons and shapes.

Some idea of how light these tenders are may be obtained from comparing the ratio between their light and loaded weights, which is

$$\frac{18.7 \text{ metric tons}}{29 \text{ metric tons}} = 0.64,$$

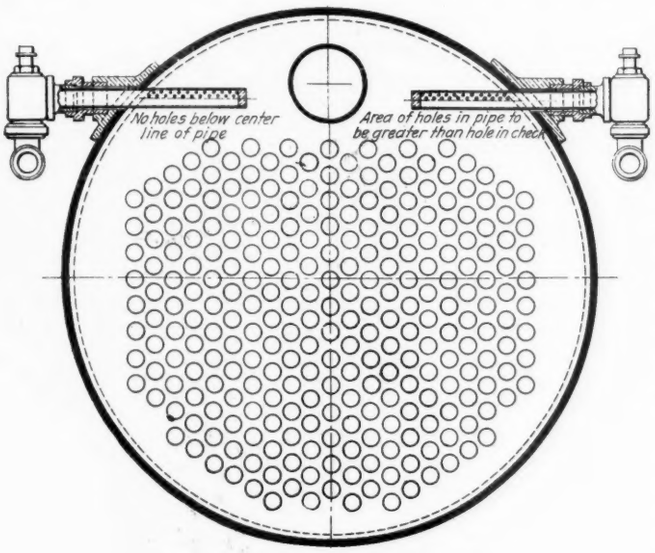
with the like ratio of the last tenders built by the same road, viz.:

$$\frac{17.1 \text{ metric tons}}{19.2} = 0.89.$$

Seventeen of these locomotives are already in regular service, and while they are not capable of hauling express trains at the same speed as the Atlantic type locomotives previously used, yet for heavy trains and at fairly high speeds, they are very satisfactory and make excellent time.

THE SEDDON BOILER FEED.

At the September meeting of the Traveling Engineers' Association J. D. Emerson, in a report on boiler check valves, described a device that has been in use on the Duluth, Missabe & Northern, by which the feed water is injected into the steam



The Seddon Boiler Feed Device.

space instead of below the water level. It was designed by C. W. Seddon, superintendent of motive power of the road.

It is a modification of the old arrangement of using a top check that has been used to some extent in this country and quite extensively abroad. In the Seddon arrangement there is a perforated copper pipe extending in from the check for some distance inside of the boiler, and it is located above the water line. This pipe is perforated on the top only, so that the water is sprayed upward and has to pass through a considerable space filled with steam before it reaches the water.

The device has been placed on a number of new engines that had just been received from the locomotive works, which it had been impossible to get over the road satisfactorily because of failure to steam, as well as of leakage of the tubes. In addition to this there were some classes of engines that the company was unable to keep out of the shops for a normal length of time because of tube failures. As soon as this form of delivery was installed the troubles stopped and no more difficulty was experienced.

According to Mr. Seddon, the result is to produce better circulation; eliminate leakage of tubes and locomotive failures resulting from the same; lost time and expense in the roundhouse incidental to calking of tubes and firebox seams; overcome the breakage of staybolts due to fluctuating temperatures of water, and, further, to effect a visible saving of fuel.

These statements are not theoretical, but rather are the result of long, practical and exhaustive tests on lines where the conditions are very severe. After being in service for two years and to-day being applied to all their power, the records on one line show the following very remarkable results:

1. No boiler failures chargeable to leaky tubes.
2. Seventy-five per cent. less work for boilermakers in the roundhouse on running repairs.
3. An increase in train tonnage of 10 per cent.
4. A saving of fuel of 10 per cent.

JOINT CAR INSPECTORS.

The annual meeting of the Chief Joint Car Inspectors' and Car Foremen's Association was held at Buffalo, N. Y., September 15, 16 and 17. President Boutet, in his address, said that the association was steadily growing and it is being well spoken of by railway officers. During the past year the number of members has been increased by 51. Mr. Boutet suggested that article 2 of the constitution should be changed so as to define the object of the association as being "to agree upon such recommendations to the M. C. B. Association as will bring about absolute uniformity in interchange of cars" everywhere. The longest paper presented to the meeting was one by L. D. Roberts, of Pueblo, Colo., describing the work of the Joint Car Inspection & Interchange Bureau of that city, of which he is the manager. Pueblo was the first city to combine in one bureau the functions of inspecting the cars and making the interchange reports. The principal features of Mr. Roberts' paper are reprinted in another column of this issue.

Other speakers were T. J. O'Donnell, arbitrator of the Niagara frontier agreement, who described the work at that point; F. M. Lucore, assistant to the general agent of the American Railway Association; E. Chamberlain, chairman of the freight car pool of the New York Central Lines; F. W. Brazier, superintendent of rolling stock of the New York Central & Hudson River, and F. W. Trapnell, chief interchange inspector at Kansas City.

Mr. Trapnell described the joint inspection work in Kansas City. Before the new plan was adopted the cost of the work for a month had been $9,698; by consolidating forces the cost was $6,049, making a saving of $3,649. Continuing, Mr. Trapnell said:

"In Kansas City we made seven groups of inspection, and recommended a captain for each group, so that there would be a head for each inspection point, the captains to receive additional pay. The day captains received $10 a month, and the night captains $15 a month additional, so that at all times the inspectors had an incentive to work faithfully, as there was promotion in their work. At rush hours, if sufficient men were not there to handle without delay, the captain would call for additional force. Through the captains the Chief Inspector may direct the men, and in that manner always

have a flexible organization. The inspectors are furnished with a self-locking seal, to use if they should find a car seal broken. . . . In the place of strife we now have harmony. There is also a great benefit to be derived from joint inspection in the per diem reports. The joint inspector's report is final, and the squabble between the delivering and receiving agent is done away with. Some will object to the car inspector acting as interchange clerk, claiming he has not sufficient time, but the additional work is very little. . . . The interchange clerk's time to each car averages 1 minute and 9 seconds."

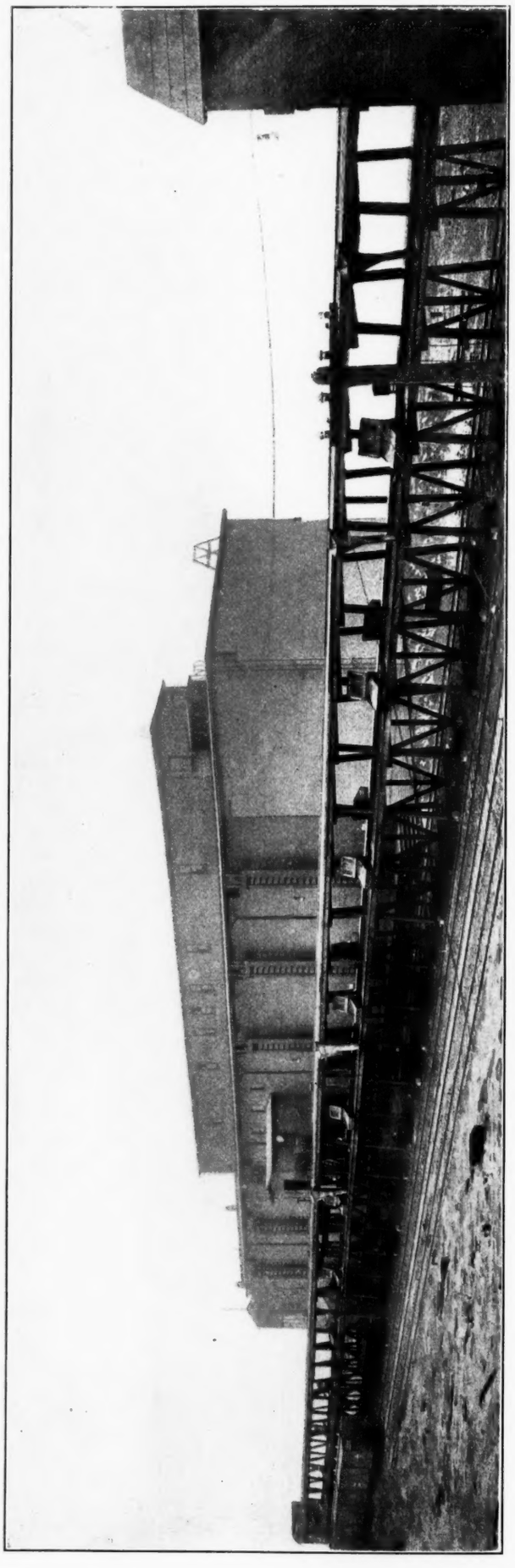
The officers of the Inspectors' and Foremen's Association elected for the ensuing year are: President, H. Boutet, Cincinnati, Ohio (re-elected); vice-president, F. W. Trapnell, Kansas City, Mo.; secretary and treasurer, S. Skidmore, Cincinnati, Ohio (re-elected).

ICING STATIONS ON THE BURLINGTON.

The Chicago, Burlington & Quincy within the past three or four years has built several icing stations, which because of their economy and convenience and the low uniform temperature obtainable in hottest weather have attracted much attention from refrigerating engineers and others interested in this feature of railway service. These stations are the result of a careful study of the best practice of the country at the time they were built. There are three—one at Galesburg, Ill., of 16,000 tons capacity; one at Chicago (Hawthorne yards), of 10,000 tons capacity, and one at Kansas City, Mo. (Murray yards), of 6,000 tons capacity. The Galesburg house has a crusher for icing meat cars also. The Hawthorne and Murray houses have no crushers, as the icing there is almost entirely fruit and vegetable cars, which require cake ice.

The foundation of the houses is concrete. The framework is made of 2-in. x 6-in. x 12-in. studding with sawdust packed between and insulated, as shown in the illustrations. Beginning with the outside face of the wall, first there is one layer or thickness of house or drop siding, then, in the order given, two layers of heavy "Neponset" insulating paper, one thickness of sheathing boards, a space between the 6-in. studding packed with sawdust, two layers of insulating paper, one thickness of sheathing boards, and a 12-in. dead air space between the 12-in. studding; one thickness of sheathing, two layers of paper, a space between the 2-in. x 2-in. furring strips filled compactly with "Flax Lith" blocks coated on the inside with one coat of "Antiaqua" cement applied hot; two layers of paper, and a finish of one thickness of sheathing boards. The inside walls between the rooms and the ceilings are also insulated and packed with sawdust. The building is divided into rooms which hold each about 2,000 tons of cake ice. A house of 15,000 tons capacity has seven rooms, each of which is equipped with an inside hoist for raising ice to the top of the room, to be run to the crusher room, located over the center room of the house. Hoists are also placed on the outside of the house for filling it with ice. These outside hoists extend from a platform adjoining the house, 4 ft. above the track level, to the top of the house. In filling the house no packing is used, the cakes of ice being laid close together, either on edge or flat, and the rooms filled to within 4 ft. of the top. Records show that during the hottest weather the temperature in the ice chambers is about 35 deg. F.

In front of and parallel with the length of the house is a double-deck icing platform. The upper platform is used for icing cars of fresh meat with crushed ice and the lower one for icing cars of fruit and vegetables with cake ice. There are tracks on both sides of the platform, on which cars are placed while being iced. In icing cars from the upper platform carts filled with crushed ice are distributed along the platform shortly before a train arrives. When the latter is in position at the platform, the covers of the ice tanks on the



Chicago, Burlington & Quincy Ice House at Galesburg, Ill.

cars are removed and the crushed ice emptied from the ice carts into the tanks by means of a spout adjusted on the edge of the platform, and which is easily moved from car to car on a trolley rod attached to the platform. A supply of coarse salt used to mix with the crushed ice is kept in boxes placed at intervals on the lower platform and is shoveled into the ice tanks or put into them with pails. The time consumed in re-icing cars with crushed ice and salt is from one to two minutes to the car. If the station has advance information of the coming of a train for icing, so that all preparations can be made, 50 cars can be supplied with crushed ice in an hour.

The lower platform from which cars are iced with cake ice is nearly on a level with the top of the cars. The cakes of ice are run on skids from this platform into the tanks of cars.

The crusher and the hoists for filling the house and for raising ice to the crusher room are run by electric motors. The hoists are so connected to the cable drums that they can be operated singly or in sets. Ice can be taken from several rooms at the same time. The outside hoists are operated in the same manner and from the same drums. The hoists are controlled from the carriage and each has a capacity of 30 tons an hour. The crusher has a capacity of 75 tons an hour. The crushed ice is run direct from the crusher into the carts, each of which holds 1,000 lbs. These carts are on a floor below the crusher on a level with the upper icing platform. Ice taken from the storage room is raised to the top of the rooms and from the hoists is run on skids by gravity direct to the crusher or to the lower icing platform.

JOINT CAR INSPECTION AT PUEBLO.*

BY L. D. ROBERTS.

Our men write all records in duplicate, retaining the carbon copy at the point of interchange for mechanical reference, and turning into the bureau office the hard copy as the official record of the car. These records we gather, with messenger, three times daily, to wit: 7:00 a. m., 1:00 p. m. and 4:00 p. m. Upon arrival of the records in the bureau office they are checked to verify numbers and initials. The stenographer then compiles, on his machine, at one writing, the interchange data required by the car accountant, agent, yardmaster, et al., of both the delivering and the receiving line. These reports are completed on the previous day's business by 3:00 p. m. although local deliveries of the completed report begin as early as 9:00 a. m. We mail the reports to the car accountant direct, in some cases; while in other they pass through the local offices in order to check individual lines' business where joint yard agreement exists. The accuracy of this report is not a responsibility that rests alone with the inspector and stenographer because in one instance we are compelled to get switch lists to determine the actual car delivered, there being no regular interchange track and the delivering line's engine handling the car after inspection. In another instance, on account of a joint yard agreement where each of two lines claims individual possession of its respective cars, we are compelled to check the receiving and forwarding books before we can render competent reports. We find, however, in neither case is there anything specially detrimental to the consolidated bureau, nor is additional cost entailed.

The work on the part of the joint inspector, under the consolidated plan has not been materially increased. By close observation we have ascertained, at Pueblo, that only about 30 per cent. of our cars are under seal, the remaining 70 per cent. being either open cars or empties routing home.

It was a mechanical contention, at first, that the duties of the inspectors under the consolidation plan would be so materially increased that the mechanical inspection would suffer. * * * These delays have not developed in our experience. The condition was magnified because it was unknown and dreaded.

The major portion of our interchanges are made in the daytime and as a consequence we have two men on each transfer. One of these men does the writing one way and the other, whose hands are free, examines the car underneath, noting the condition on his side of the car and secures the end-door seals. This same inspector retraces his steps over the roofs of the car, while his companion follows along on the ground and checks, in order to verify, the car numbers and initials. Working in pairs in this manner has overcome every tendency to delay and as far as the mechanical inspection is concerned, rather than neglect, I am glad to state that on the contrary it has improved. The habit of being accurate has been instilled into every one of our inspectors and, while it started with car numbers and initials, seals and ice boxes, under the consolidated plan, it now has been carried to the physical condition of the car.

The taking of seals, etc., has been a school for the inspector that he long has needed to attract his attention to cases of apparent oversight. Many errors which he previously has made have never been called to his attention because of lack of checking facilities; but with the responsibility for interchange data in his hands the errors stand out so prominently that habitual vigilance has become a second nature to him.

Of a daily interchange, under normal conditions, of between 800 and 1,000 cars we do not average more than one bad order load to be set back for the delivering line to repair.

Preceding consolidation, the line of demarcation between the mechanical and transportation departments had been vividly drawn, the breach being as distinct as that between a man and woman divorced. Since consolidation a complete reconciliation has been effected, and now, with a dual responsibility, there is a harmony, a mutual interest, in the two departments more perfect than I have ever before seen.

It has been claimed that when inspectors have the authority to examine, remove and apply seals, from any cause, the opportunities for pilfering have been correspondingly increased. This is going a long way to find an objection against consolidation. Railway companies must trust some one and why not the inspector? Another criticism, the alleged illegibility of handwriting. That could not be a serious objection even were the fact established, as his records are handled exclusively by the bureau office, where the interchange data is compiled. I am pleased to say that, as far as Pueblo is concerned, the writing of its inspectors will compare favorably with that of any clerical force employed by any railway department, except possibly that which executes vouchers and payrolls. Still another objection has been that the inspector's hands were not clean enough to attempt the clerical work. Of course his hands are not suggestive of the manicurist, but even at that the objection will not stand, because he does not compile the interchange report; he simply furnishes the data.

Some one made the claim that our inspectors did not take kindly to the work because of the slight increase in pay. If such is the case it has never manifested itself in my presence.

The seals in use by our bureau are automatic, thus avoiding the use of the sealing iron. They are identified by the words "Pueblo Bureau" stamped thereon and are consecutively numbered. * * * Regarding errors in car numbers and initials and interchange data, we have not found it serious. Our men make some errors, and always will, but we have found the errors no more voluminous nor any worse under consolidation than before.

We are using pool marks on all cars which we handle. These marks indicate the delivering and receiving line, together with the date of delivery. The pool mark is placed, with chalk, on the cross-tie timber or intersill. Upon the return movement of the car this pool mark is furnished as a part of the inspector's record and it must match with the record in the office. We maintain a location book and this

*Extracts from a paper read at the meeting of the Chief Joint Inspectors' & Car Foremen's Association, at Buffalo, September 15.

ready reference factor, with the pool mark, enables us to locate errors, often before they become apparent to the car accountant.

The first month's operation under the consolidated plan was at an additional expense of $315.77. Of this sum nearly $100 was expended for permanent office fixtures, 15-inch carriage typewriter, etc. Subsequent months have cost in labor $205, and such sums in addition as have been expended for stationery and supplies, plus one-half of various common expenses, *i. e.*, rental, phone, etc., that had hitherto been borne by the mechanical department alone.

With the exception of the two instances, we do no carding of cars whatever, this being done by the delivering line as per agreement. These cards are supplied by them upon the arrival of their trains in their breaking-up yards. This practice has been of inestimable benefit to switch crews and has resulted in almost entirely eliminating the wrongful delivery of cars, as was a common occurrence under the old plan when we used switch lists made out in the yard offices.

STEEL UNDERFRAME FOR PASSENGER CARS.

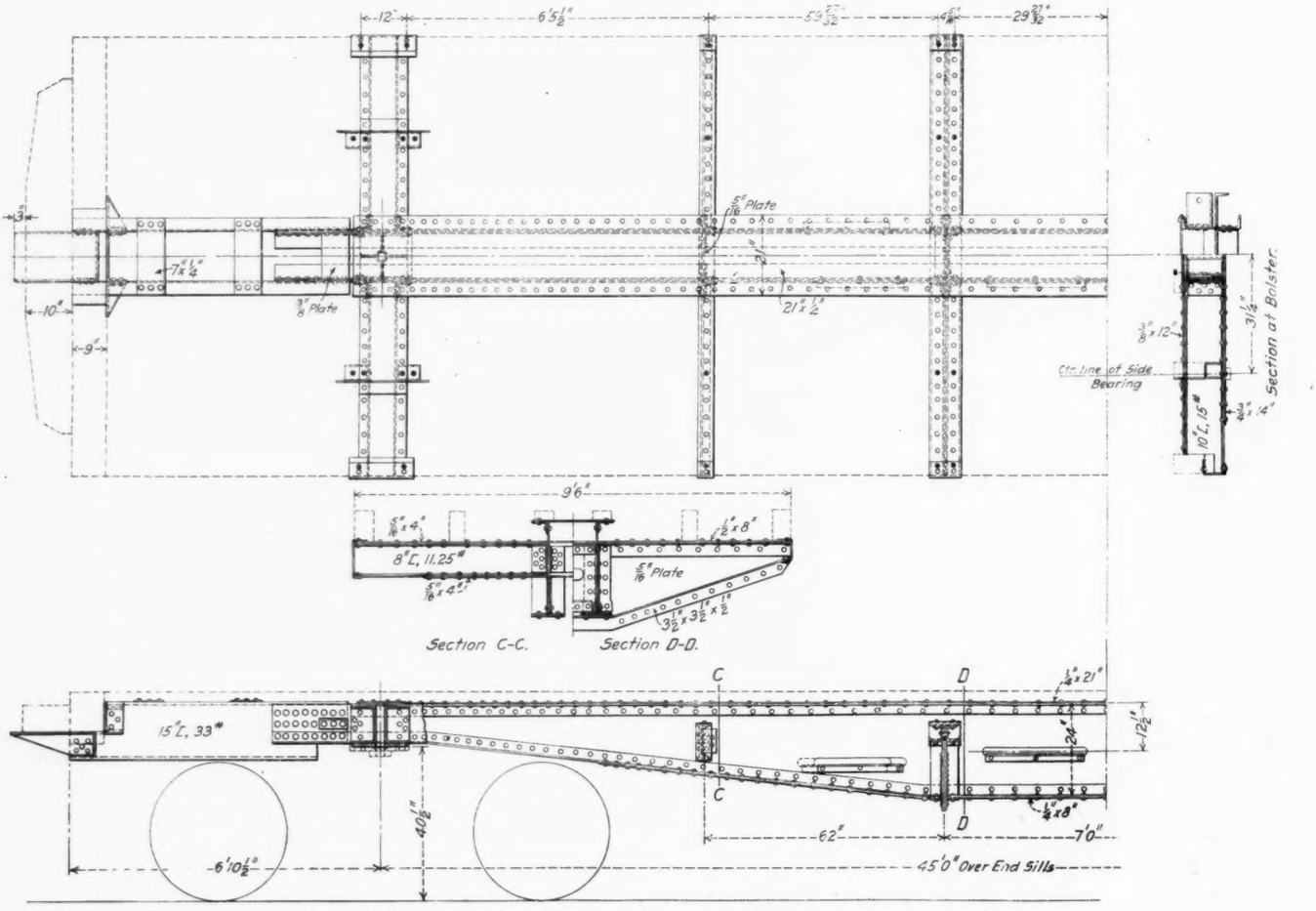
The Erie Railroad has recently rebuilt a number of its passenger cars of old design, and in doing so has made application of a built-up steel underframe. Through the courtesy of Thomas Rumney, general mechanical superintendent, an engraving of this underframing is shown herewith. It differs from the steel underframings used in cars of new design, in that it has no side sills; or, rather, in that the old wooden side sills are left intact and in place, ostensibly to perform the same functions as before, though in reality relieved of much of their load. In fact, this new underframe is practically the one upon which the old car body is carried, while relieved of a greater part of its load. It consists of two heavy center sills, with cantilever cross-bearers extending like ribs on either side, at the ends of which the side sills of the car body are carried. An exception to this is made at the ends where provision is made for the reception of the end sill, which, with the end and side framing, is depended upon to carry the corners of the car.

The cantilever cross-bearers are located at truck center, forming the body bolster, and at a distance of 3 ft. 6 in. on each side of the center, thus holding up the center. The center sills are built up, for each sill, of a $\frac{5}{16}$-in. plate 24 in. deep at the center, and stiffened by 4 in. by 3 in. by $\frac{5}{16}$-in. angles, of which there are two at the bottom and one at the top. In addition to this there is a cover plate ¼ in. thick and 21 in. wide riveted to the upper angles. This cover plate extends between the bolsters and is held by ¾-in. rivets spaced 3 in. on centers to a point 6 ft. 5½ in. inside the bolster, at which an 8-in. channel is riveted as a bearer. Between these two points the rivet spacing is increased to 5 in.

The bolsters are 10-in. 15-lb. channels footed against the sills and held by angles. They are built into a box girder by cover plates at the top and bottom, and the space between the sills is filled in with a casting, with a hole for the center pin.

The built-up section of the sills ends at the bolster, and beyond this point they are formed of 15-in. 33-lb. channels, held in place by welt pieces, through which a nest of 24 ⅞-in. rivets are driven.

With this arrangement the car body and its framing is relieved of all buffing and pulling stresses, as these are all carried in a direct line from one end of the car to the other. So that the strengthening features of the steel underframe are obtained while still utilizing the old bodies which are still serviceable and suited to the traffic.



Steel Underframe for Combination Baggage and Mail Cars; Erie Railroad.

TRAIN RESISTANCE.

BY F. J. COLE,
Consulting Engineer, American Locomotive Co.

VI.

PASSENGER CAR RESISTANCE.

Question 4. Have you any data regarding resistance per ton for passenger cars? If so, do you use a different amount per ton for cars of varying weights?

Pennsylvania Railroad.

For passenger cars at high speeds the resistance is approximately to the rule R = 3 + 13.15% V, where R is in pounds per ton and V is in miles per hour. This rule probably gives too high results at low speeds up to 30 miles per hour, but about right at speeds from 50 to 75 miles per hour. We know of no reason why passenger cars of varying weights should not vary in resistance as do freight cars, and at freight train speeds we have no data to show that passenger cars do not have the same resistance as freight cars of the same gross weight.

Chicago, Burlington & Quincy.

For passenger car resistance we use the following formula, which was derived from dynamometer tests:

$$\frac{V^2}{468} \text{ and } 2\tfrac{1}{2} = R$$

In which V equals miles per hour and R the resistance in lbs. per ton.

ENGINE RESISTANCE.

Question 5. Resistance per ton at various speeds for engine and tender alone apart from train. P. R. R. St. Louis tests averaged for oil lubrication 22.35 lbs. per ton for driving axle and machinery friction alone. Some road tests show resistance from 15 to 18 lbs. per ton between 10 and 32 miles per hour.

Pennsylvania Railroad.

We are not prepared to give any better figure for the resistance of engine and tender alone, apart from train, than they have quoted as being taken from P. R. R. St. Louis tests, in which the average for oil lubrication was found to be 22.35 pounds per ton for driving axles and machine friction alone.

Our reports of November 16th, 1893, and January 6th, 1894, on four tests of class X and class P locomotives were made with this in view. The friction obtained for a distance of about 11.7 miles over which the average total indicated pull was 12,855 pounds and the average dynamometer pull reduced to what the locomotive could have exerted on the same track if level, but otherwise under the same conditions was 11,050 pounds, and therefore, the average total engine resistance 1805 pounds, or 14.1 per cent. of the total engine pull, or an average of 18.7 pounds per ton for locomotive and tender weight.

The following table taken from our report of January 6th, 1896, may be of some value in this connection, but it should be remembered that the percentage which the engine friction is of the total indicated power depends entirely on the weight of train behind the engine, as evidently if there is no train behind the engine and it does all it can in moving itself, 100 per cent. is consumed in the engine.

Test of Classes "X" and "P" Engines, November 16th, 1893, and January 6th, 1894, between Altoona and Gallitzin.

Locomotive, Number and Class.	"X" 276		"P" 1525	
Date of test	4-1-93	3-24-93	3-23-93	3-23-93
Distance run, feet	61,695	61,600	61,842	61,400
W't train, inc. dynamometer car, tons*	238.45	212.75	189.6	186.75
Weight, locomotive and tender, tons*	105.5	105.5	88.0	88.0
No. of coaches, empty passenger and dynamometer	10	9	8	8
Time of run, minutes	39.92	32.22	35.18	32.33
Average speed, miles per hour	17.56	21.73	19.97	21.53
Total	144	118	119	124
No. of indicated cards, per mile	12.3	10.1	10.2	10.7
Average indicated pull, lbs.	14.542	13.494	11,609	11,774
Av. dynamometer pull reduced to level	12.614	11,610	9,927	10,055
Locomotive resistance, totals lbs.	1.928	1.884	1,682	1,719
Latter in per cent. of indicated pull	13.26	13.97	14.49	14.61
Latter in lbs. per ton of locomotive w't	18.2	17.9	19.1	19.5

*Ton of 2,000 lbs.

Chicago, Burlington & Quincy.

Our tests show from 15 to 18 lbs. per ton at speeds between 10 and 32 miles, the lowest being at about 25 miles.

Baltimore & Ohio.

Six to eight miles an hour the friction of locomotive and tender combined about ten pounds per ton.

Southern Pacific.

The same resistance per ton for engine and tender as for cars.

CURVES.

Question 6. How much resistance per ton per degree for uncompensated curves?

Pennsylvania Railroad.

The curve resistances given in the following table have been obtained by P. R. R. dynamometer tests. In each case the results have been corrected for grade and acceleration, and the resistance due to level tangent track has been deducted, leaving the average resistance per degree due to curvature only for the entire curve or portion of the curve measured. But different trains passing over the same curve gave different results, and of these different results are given the maximum, minimum and average result and the average of the averages.

Average Resistance Due to Level Curve—Pounds per Ton per Degree at Slow Speeds with Freight Trains.

Degree of curve.	From point of curvature where train enters curve to point of tangent where train is just all off curve			From point where train is just all on curve to point of tangent, train just commencing to leave curve		
	Max.	Min.	Av'ge.	Max.	Min.	Av'ge.
2 deg. 0 min.	1.54	0.76	1.01	1.16	0.12	0.58
1 " 0 "	0.98	0.20	0.51	1.22	0.42	0.74
1 " 0 "	1.68	0.47	0.89	1.74	0.69	1.73
0 " 15 "	....	....	....	1.32	0.08	0.87
Average	....	....	0.80	....	....	0.83

Older experiments on a 4 degree curve gave an average of 1.35 pounds per ton per degree.

Baltimore & Ohio.

Resistance per ton per degree about ½ pound.

Southern Pacific.

For each degree of curvature for curves below 7 degrees, .8 of a pound per ton, and above 7 degrees, 1 pound per ton.

Question 7. What equivalent grade or resistance per ton per degree for compensating curves?

Pennsylvania Railroad.

The curves on our low grade freight line are compensated at the rate of one pound per ton per degree of curve and we believe this has proven about right where all trains are considered. We do not, however, regard these figures on curve resistance as final, but they are the best figures we have at present.

Baltimore & Ohio.

The equivalent grade, or resistance per ton per degree for compensating curves is .035.

Southern Pacific.

Each degree of curvature for curves below 7 degrees offers a resistance equal to .04% grade, and for curves above 7 degrees .05%.

WEATHER.

Question 8. Do you use different resistances per ton for freight cars for weather and wind conditions? If so, please advise in detail.

Pennsylvania Railroad.

The present practice is to reduce the adjusted tonnage for cold and bad weather conditions, maintaining the same car factor. This is illustrated by the following table:

Engine Rating for Eastbound Middle Division Engines, Adjusted Tonnage, 45 as a Factor.

Rating.	Temp., deg. F.	Deduction.	Class of engine F3.	H6a.	H8.
A	Summer	.....	5,760	7,200	8,280
B	45 to 35	5 per cent.	5,472	6,840	7,866
C	35 " 25	10 "	5,184	6,480	7,452
D	25 " 15	15 "	4,896	6,120	7,038
E	15 " 5	20 "	4,608	5,760	6,624
F	Under 5 or stormy	25 "	4,320	5,400	6,210
G	Emergency	50 "	2,880	3,600	4,140

Maximum number of cars per train, 87.

For the westbound trains over the same division the same

percentages of deduction are made for changes of the weather, maintaining a constant factor of 8 and on the basis of a summer rating for the H6a of 2,400 tons. The F3 in all cases being loaded 20 per cent. less than the H6a and the H8 loaded 15 per cent. more than the H6a.

Chicago, Burlington & Quincy.

Yes.

Baltimore & Ohio.

We use different resistances for weather conditions, as shown by the temperatures in question number 2, while with wind we have no fixed rule, as this is variable.

Southern Pacific.

We do not use different resistances for freight cars for wind and weather conditions. However, allowances are made to suit local conditions.

RAILS.

Question 9. In Dr. P. H. Dudley's Condensed Diagrams of the Inspection of the New York Central, 1899, there is the following:

"With light 4½ in. 65 lb. rails the freight train resistance is 7 to 8 lbs. per ton, which is now reduced to 3½ lbs. on the 5⅛ in. 80 lbs. rails for 60,000 lbs. capacity cars on long trains. For 80,000 to 100,000 lbs. capacity cars, it is still less."

Have you any data showing whether the increase in capacity of cars or in weight of rails accounts for this great difference?

Pennsylvania Railroad.

Regarding capacity of cars; answered in Question 1. Influence of weight of rail; no definite data. In a general way resistance is much higher on bad track, where the rails are usually light.

Baltimore & Ohio.

The greatest amount of difference between the cars shown is evidently due to the 100,000 pound capacity cars, as shown by the above resistances.

SUMMARY.

Some general conclusions from the facts set forth in this report are as follows:

The resistance of freight cars varies greatly with their capacity, weight, and whether empty or loaded.

The decrease in resistance on level, straight track of 50 ton capacity cars (total about 72 tons) is of great significance in estimating tonnage ratings on low grade roads. This decrease in resistance becomes of gradually less importance with increase of grade.

The resistance of American freight cars is practically the same between the limits of 5-10 and 30-35 m. p. h.

Engine friction should be considered apart from the resistance of cars and estimated from the weight on drivers. The tender and part of engine supported on trucks or trailing wheels may be taken at the same resistance per ton as cars of approximate weight.

Engine friction may be approximated by multiplying the weight on drivers in tons by 22.2 lbs. per ton.

Head air resistance may be estimated by multiplying the cross-sectional area in square feet by $.002V^2$.

The resistance per degree of curvature in pounds per ton should not be taken at less than .08 for ordinary conditions.

The maximum horse power of a locomotive is usaully reached at about 700 feet piston speed per minute; constant horse power at 700 to 1,000, decreasing slightly at higher speeds with the decrease of efficiency of the engine.

The resistance of passenger trains has generally been overestimated, but the decrease in available power of locomotives at high speeds due to the decrease in mean effective pressure in combination with the energy absorbed in moving the engine and tender has generally been underestimated.

Journal friction is greatest at starting, then rapidly decreasing and gradually reaching its minimum somewhere around 20 to 30 m. p. h., afterwards remaining constant or slightly increasing.

Journal friction with good lubrication, within the limits of railway pressures, probably varies inversely as the square root of the pressure.

With large capacity loaded cars at freight car speed on good track, journal friction forms a large percentage of the total resistance.

The condition of track, stiffness of rails, etc., are important factors in train resistance, because much energy is expended on poor track in dampened oscillations which cause an absorption of energy, and concussions which cause principally an increase in flange friction.

The segregation of the components of train resistance is very desirable, but much work remains to be done in analysis and experiments before satisfactory conclusions can be arrived at.

Flange action alone cannot be accepted as accounting for the total difference in resistance per ton of light and heavy, empty and loaded cars until more evidence is produced.

There is comparatively little lateral play between flange and rail unaccompanied by lifting the wheel from the rail on correctly gaged track and properly mounted wheels, especially when M. C. B. flange and tread and American Society Civil Engineers rail sections are used.

A large radius at the throat of the flange and a relatively smaller radius at the head of rail are of great value in de-

DATA OBTAINED FROM TRAINS HAULED ON VARIOUS RAILWAYS, COMPARED WITH FIGURES FROM TABLES AND CHARTS.

Road, date, kind of train and location.	Tons behind tender, per car.	Miles per hour, Pr ct. of grade, curvature.	Tractive power max. available.	Resistances: Pounds per ton due to speed, grade curvature.	Locomotive: Driving.	Locomotive: Truck and tendr.	Cars.	Total of all.	Margin of power over all resistance: Pounds.	Margin of power over all resistance: Per cent.
Penn. R.R.—June 14, 1909.—Freight; Altoona to Enola	5,953	17.0	45,300	3.0	2,330	279	17,859			
		0.2	45,300	4.0	420	372	23,812			
	70	....		.....				45,072	+228	0.5
Virginian Ry.—Spring, 1909.—Freight, 90 cars; Roanoke to Sewall's Point	6,856	Slow.	50,350	2.84	2,310	329	19,431			
		0.2	50,350	4.0	416	440	27,424			
	76	....		.....				50,350	.....	....
Same as above, except 85 cars	6,000	Slow.	50,350	3.04	2,310	330	18,000			
		0.2	50,350	4.0	416	440	24,000			
	70.5	....		.....				45,496	+4,854	9.65
Penn R.R.—July, '09—6 cars, 18-hr. train between Fort Wayne and Crest line	360	69.0	23,800	11.25	2,373	1,200	4,050			
		....	7,660	.....	.....	.....	.....			
	60	....		.....				7,623	+37	0.48
N. Y. C.—July 24, 1909—5 cars, 20th Century; Elkhart and Toledo	314.6	70.2	29,200	11.49	3,069	1,482	3,617			
		....	8,322	.....	.....	.....	.....			
	62.9	....		.....				8,168	+154	1.85
Same as above, except May 23, 1909, 9 cars	564.2	60.0	29,200	9.45	2,757	1,192	5,335			
		....	9,870	.....	.....	.....	.....			
	61.7	....		.....				9,284	+568	5.95
Same as above, except 8 cars (Spring, 1909)	505	62.0	29,200	9.8	2,800	1,255	4,950			
		....	9,630	.....	.....	.....	.....			
	63.1	....		.....				9,005	+625	6.5
N. Y. C.—Aug. 9, '99—16 cars, Southwestern Limited; New York to Albany	785	50.0	27,200	7.85	2,014	561	6,160			
		....	10,130	....	102	114	1,255			
	49	2.0		1.6				10,209	—79	—0.8

creasing flange action and in the partial absorption of lateral concussions.

Description of Engines.

Penn. R.R.—280-238 type, Class H-8-b, 24 x 28-in. cylinders, 62-in. drivers, 205 lbs. boiler pressure, maximum tractive power, 45,300 lbs.
Virginian.—282-254 type, 24 x 32-in. cylinders, 56-in. drivers, 180 lbs. boiler pressure, maximum tractive power, 50,350 lbs.
Penn. R.R.—442-178 type, Class E-2, 20½ x 26-in. cylinders, 80-in. drivers, 205 lbs. boiler pressure.
69 m. p. h. = 1,250 piston speed. Factor T. P., .322
Maximum T. P., 23,800 lbs.

N. Y. C.—462-262 type, Class K, 22 x 28-in. cylinders, 70-in. drivers, 200 lbs. boiler pressure.
70.2 m. p. h. = 1,390 piston speed. Factor T. P., .285
62.0 m. p. h. = 1,230 piston speed. Factor T. P., .33
60.0 m. p. h. = 1,192 piston speed. Factor T. P., .338
Maximum T. P., 29,200 lbs.

N. Y. C.—460-166 type, Class F, 20 x 28-in. cylinders, 70-in. drivers, 200 lbs. boiler pressure.
50 m. p. h. = 1,120 piston speed. Factor T. P., .372
Maximum T. P., 27,200 lbs.

Table of Symbols.

(1 ton = 2,000 lbs.)

A = Area in square feet.
b = wheel base of trucks in feet.
c = clearance between rail and wheel flange in inches.
D = curvature in degrees.

L = length of train in feet.
m. p. h. = miles per hour.
R = resistance in pounds per 2,000.
t = tons of 2,000 lbs.

V = speed, miles per hour.
W = total weight of car and trucks in tons (2,000 lbs.).
w = weight of two trucks.

[The author has supplemented his work with an exhaustive bibliography of considerable length. While the conditions of journalism render it impossible to publish this, it may be seen at any time at the New York office of the *Railroad Age Gazette*.—Editor.]

THE HUDSON AND MANHATTAN TUNNEL SYSTEM.

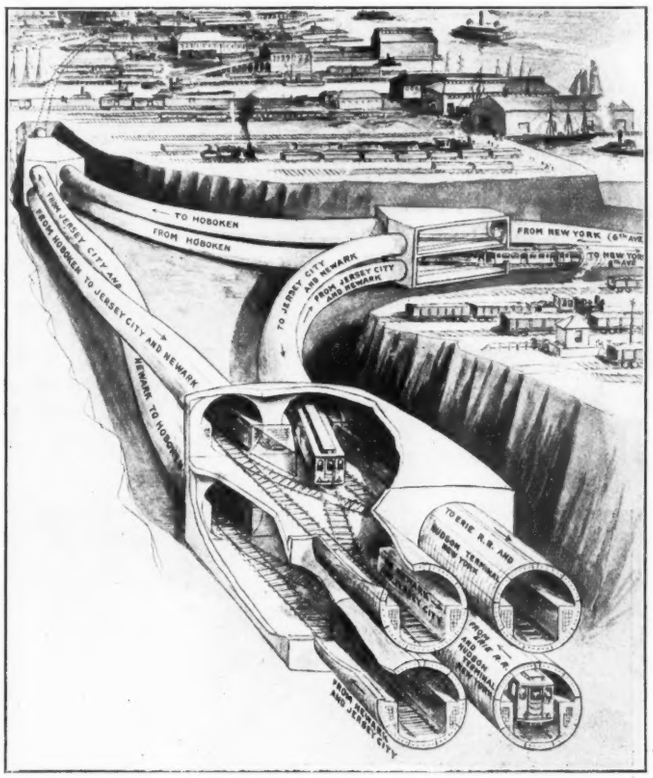
BY J. VIPOND DAVIES.

III.

In Jersey City and Hoboken, where the various tunnels of the several routes make connections between Jersey City, Hoboken and uptown New York, the elimination of grade crossings was essential to the design of the work, and, as before stated, the tunnels were superimposed for this purpose. This operation necessitated the construction of junctions in the tunnels, all of which, unfortunately, came at locations where the construction would be in loose sand or other soft formation in which grave difficulties would have been involved in making the enlargements entirely by underground methods. The enlargement at the junction of Sixth avenue and Ninth street was carried out entirely by underground methods, on account of the conditions of traffic on the streets above, which would have made open-cut methods very difficult and have caused great inconvenience to the public. This junction was constructed in sand formation overlying the rock, and as the location was in part on the site of the former Minetta creek there was a good deal of quicksand present to be taken care of. The entire work was therefore executed under air pressure. At this point the shields in the two diverging lines were carried through continuously, forming the external lines of the enlargement, and these tubes so constructed were used to brace from in constructing the enlargement. Sections of lining plates were taken out from the sides of these tubes and tunneling carried on between the tubes for the insertion of the heavy timbering put in place to carry the roof, maintaining the breast throughout and carrying the work on in section lengths. In this way excavation was carried on and the arch forming the permanent lining put in place in short section lengths but of the full structure width, having in part a clear span of 60 ft. This work was executed with only a very slight settlement of the surface of the ground. At the same time the columns of the elevated railway structure overhead were supported by long girders wedged to brackets riveted to the columns and constantly watched to take up any settlement which might occur. This method of underground enlargement was necessarily very expensive, and to execute similar work in the three different sites on the New Jersey side, each of which was of greater dimensions than the enlargement at Sixth avenue and Ninth street, made a careful detail study of the possibilities desirable.

In Jersey City, fortunately, the three junction enlargements involved came below properties occupied by the Delaware, Lackawanna & Western Railroad and the Erie Railroad for yard purposes, and by arrangement with those companies the surface of the ground was occupied for the purpose of carrying on the work therefrom. In all these cases the enlargement foundation could be carried down to rock.

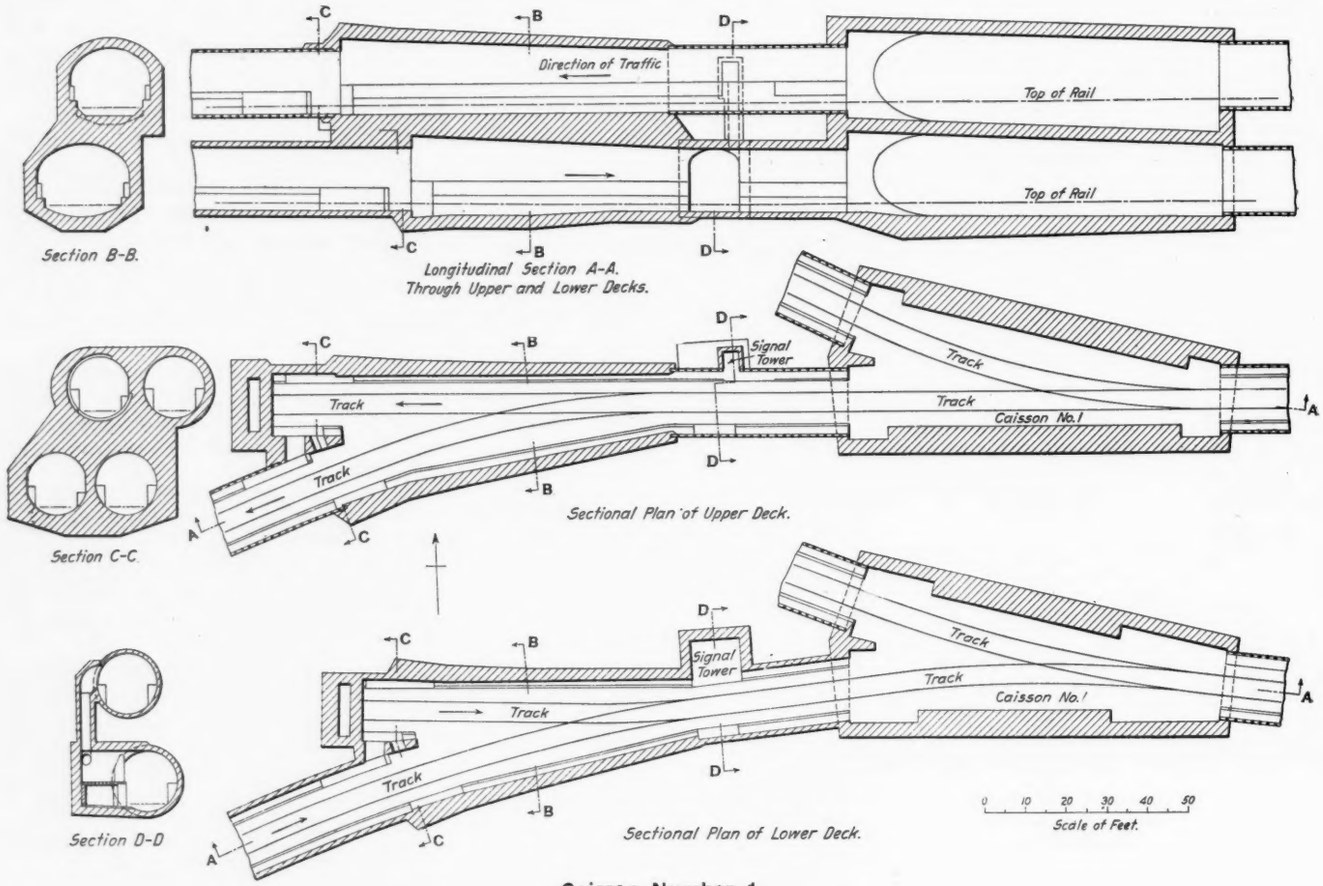
It was decided to make these enlargements by caissons sunk from the surface, and the caissons were in the first instance designed of structural steel to be internally lined with concrete, but owing to the difficulty in getting these constructed in any



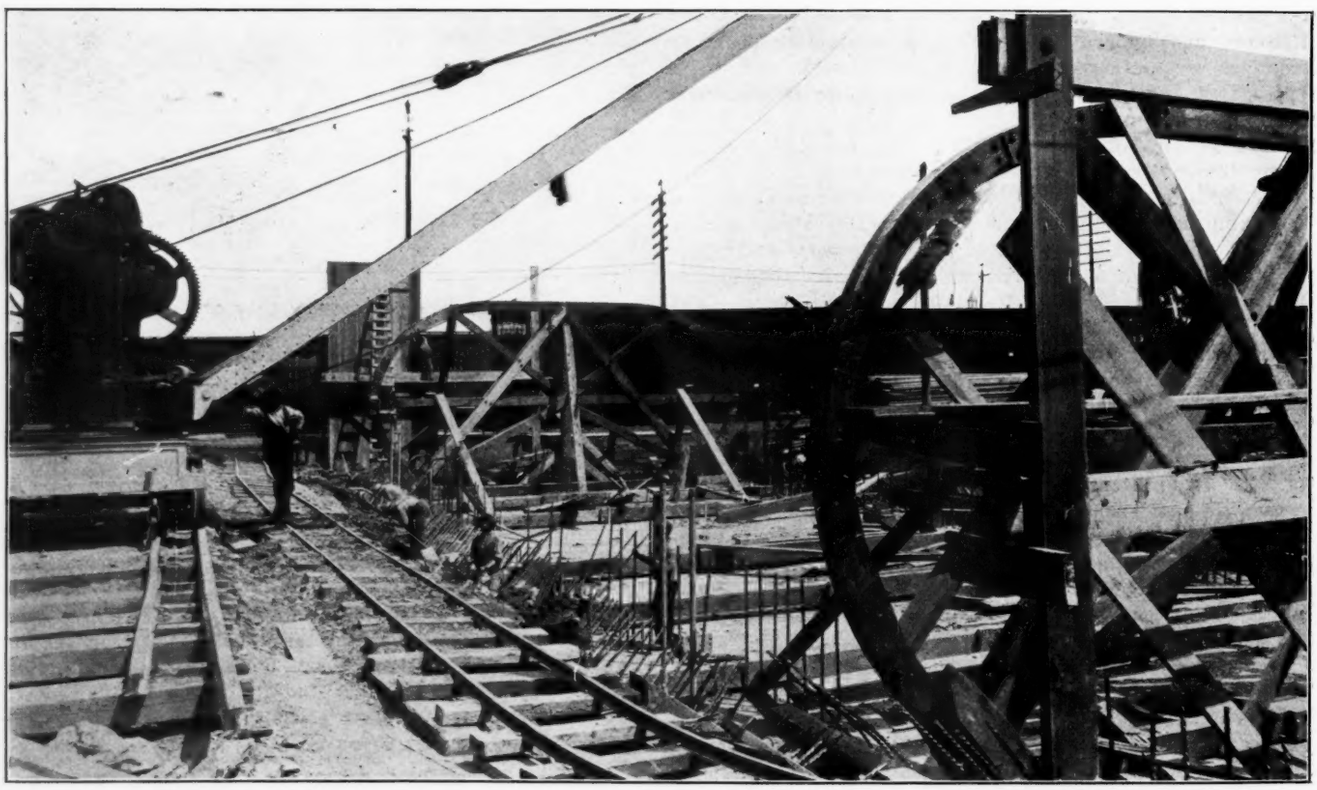
Caissons at Junction of Jersey City and Hoboken Lines.

reasonable time and to the very high prices demanded by the steel manufacturers for such construction, the situation was restudied, with the result that a plan was worked out for reinforced concrete caissons, which permitted the work to be started at once without the delay due to waiting for steel construction, and the work could also be much more cheaply executed. These caissons were therefore built on the surface of the ground with an air floor and equipped with air locks and other necessary arrangements for sinking, and the three caissons were sunk entirely from the surface in every way as though sinking a bridge pier. These caissons were internally of the same shape as the tunnels, and were sunk to the necessary grade of the tunnel constructions and carefuly sealed by filling the air chamber with concrete and backfilling on top, this backfilling, however, being carried on as the caissons were sunk so as to add effective weight in the sinking operation.

In sinking these caissons, various obstructions were found and had to be removed. At Caisson No. 1, which is located



Caisson Number 1.



Forms for Upper Deck of Caisson Number 3.

nearest to the river, a canal boat was found at a considerable depth below the surface and had to be completely cut up into small sections and removed through the air locks.

The openings in the caissons at the points where the tunnel tubes were to enter were constructed with dummy drum heads of concrete, jointed so that they could be readily cut away. As soon as the caissons reached the final elevation those drum heads through which the tunnels were to be constructed were cut out and shields erected for the commencement of tunnel construction from the caissons. In other cases, the shields driven from other points were alined so as to come to the points where the drum heads were installed in the caissons, and in every case these were very carefully brought together and the joints sealed with the tunnel lining before the drum heads were cut out.

Caisson No. 1. The main outside dimensions of this caisson are as follows:

Length	101 ft. 2 in.
Width	23 ft. 5¼ in. to 45 " 8 "
Height	51 " 0 "

This caisson tapers so as to receive the two river tunnels superimposed at the narrow end, and at the wide end two tunnels superimposed to and from Hoboken and two tunnels superimposed to and from the Erie Railroad station, Jersey City.

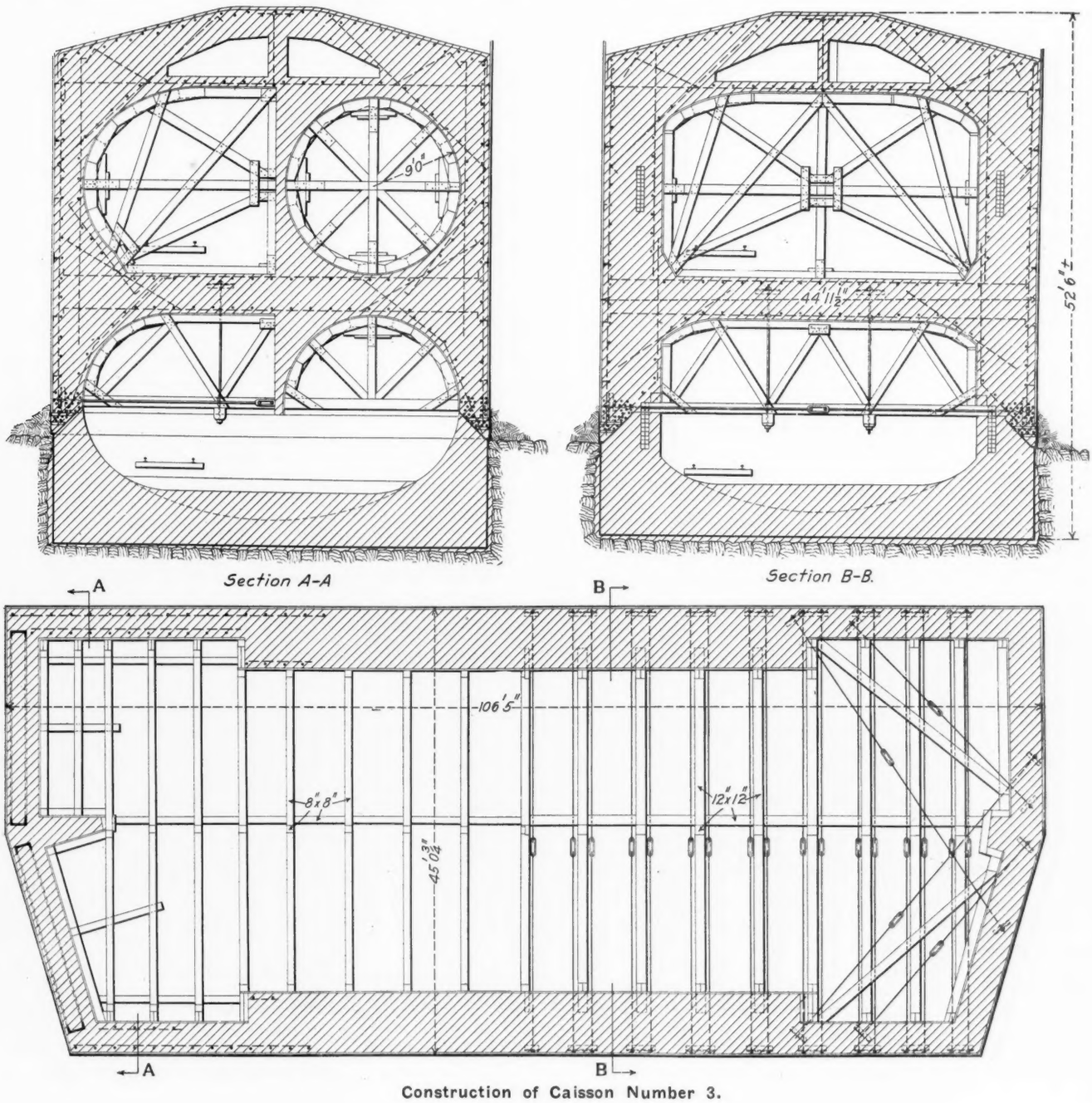
Caisson No. 2. The principal outside dimensions of this caisson are practically the same as those of Caisson No. 1. At the narrow end of this caisson are two tunnels superimposed to and from Hoboken, and at the wide end there are two tunnels superimposed to and from Jersey City and two tunnels superimposed to and from uptown New York.

Caisson No. 3. The main outside dimensions of this caisson are as follows:

Length	106 ft. 5 in.
Width	45 " 0 "
Height	43 " 11½"

This caisson was arranged with eight tunnels, as follows:

At the north end, two superimposed tunnels to and from Hoboken and two superimposed tunnels to and from New York, and on the south end two superimposed tunnels to and from Jersey City and two superimposed tunnels to be used in the future when a physical connection is made wth the tracks of the Erie Railroad.



Construction of Caisson Number 3.

SHOP KINKS.

FIRST COLLECTION (SECOND PRIZE).

BY C. J. DRURY,
General Roundhouse Foreman, Atchison, Topeka & Santa Fe, Albuquerque Shops.

DEVICE FOR PULLING PISTONS.

The accompanying cut shows a piston puller which can be made complete for 80 cents, labor and material. The

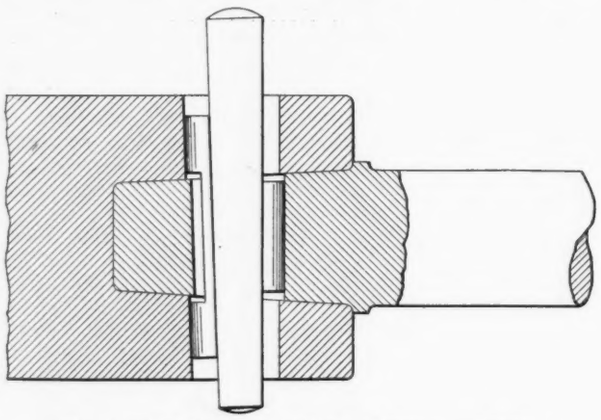


Fig. 1—Device for Pulling Pistons. Drury.

method of pulling is the reverse of that when the piston is keyed up. This is a very cheap, handy and sure device.

DEVICE FOR GRINDING CYLINDER HEADS.

This is a tool or jig that can be built for $2.25, labor and material. In some of the larger shops air motors are used for grinding front, back and intermediate cylinder heads, but the author has found this device far superior and much cheaper.

A 4-in. pipe is screwed into a 1¼-in. casting (something similar to a follower plate) with an air inlet at the bottom. The piston of this kink is made of hard wood with the slot-

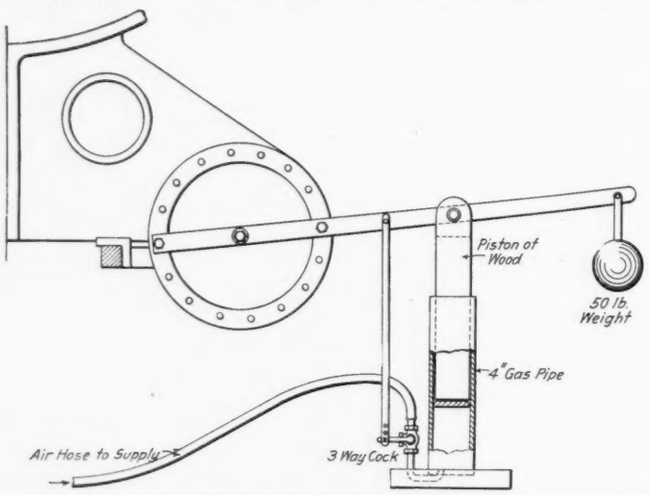


Fig. 2—Device for Grinding Cylinder Heads. Drury.

way lined with light sheet iron. At the admission of the air there is a three-way cock with an attached rod leading to the arm attached to cylinder head. All that is necessary is to turn on the air, which will start piston upward until such a time as the little connecting rod shuts off the admission of the air, when, of course, the weight on end of lever quickly brings down the piston. So, with this motion, we have an automatic cylinder grinder which is one of the most useful shop kinks in practice to-day.

DEVICE FOR TURNING DRIVING JOURNALS.

This is a device rigged up on a wheel lathe for turning driving journals. Most journal lathes are driven the same way as if the tires were to be turned. Of course the machine will run very slowly, but with the attached jig we run the belt around the driving wheels of the journal that is to be turned, and let the wheels turn on center of machine, which causes a revolution fast enough to make a neat job of the

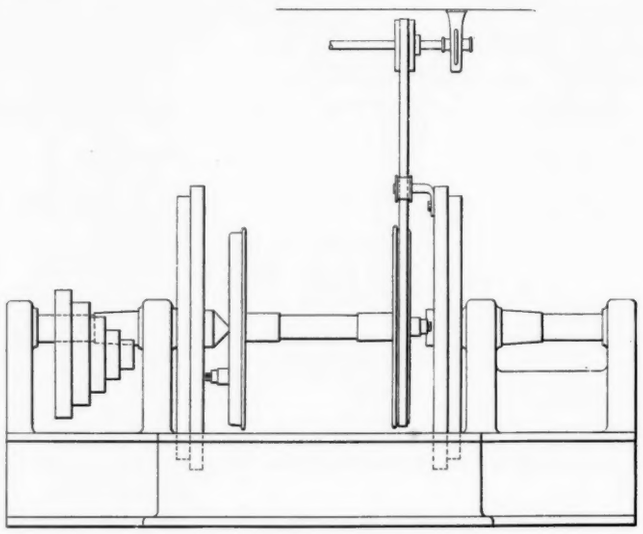


Fig. 3—Attachment on Wheel Lathe for Turning Driving Journals. Drury.

journal as well as a quick one. Note the intermediate pulley to make adjustment for different size wheels. We believe that this is the most efficient machine in practice for turning a driving journal when the wheels are mounted.

SECOND COLLECTION (HONORABLE MENTION).

BY E. J. MC KERNAN,
Supervisor of Tools, Atchison, Topeka & Santa Fe; Topeka Shops.

CRANK AXLE TURNING MACHINE.

Figs. 4 and 5 illustrate a crank axle turning machine for truing up the inside crank axle bearings of balanced compound locomotives. These bearings wear out of round more rapidly than the outside pins and must be maintained in

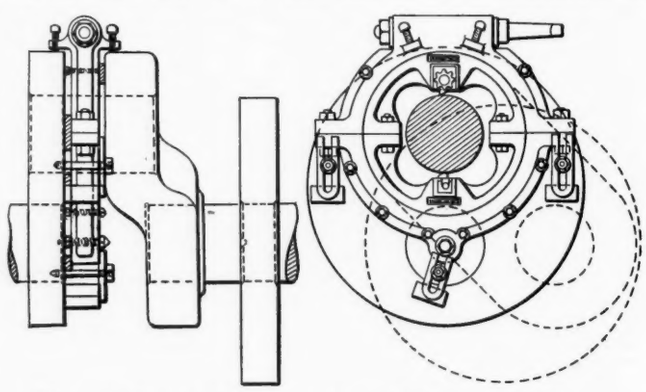


Fig. 5—Crank Axle Turning Machine. McKernan.

good condition to prevent overheating and failure. Maintaining these bearings by hand is costly and unsatisfactory. It requires a skilled mechanic from 25 to 30 hours to true up a crank axle bearing by hand, and when finished the

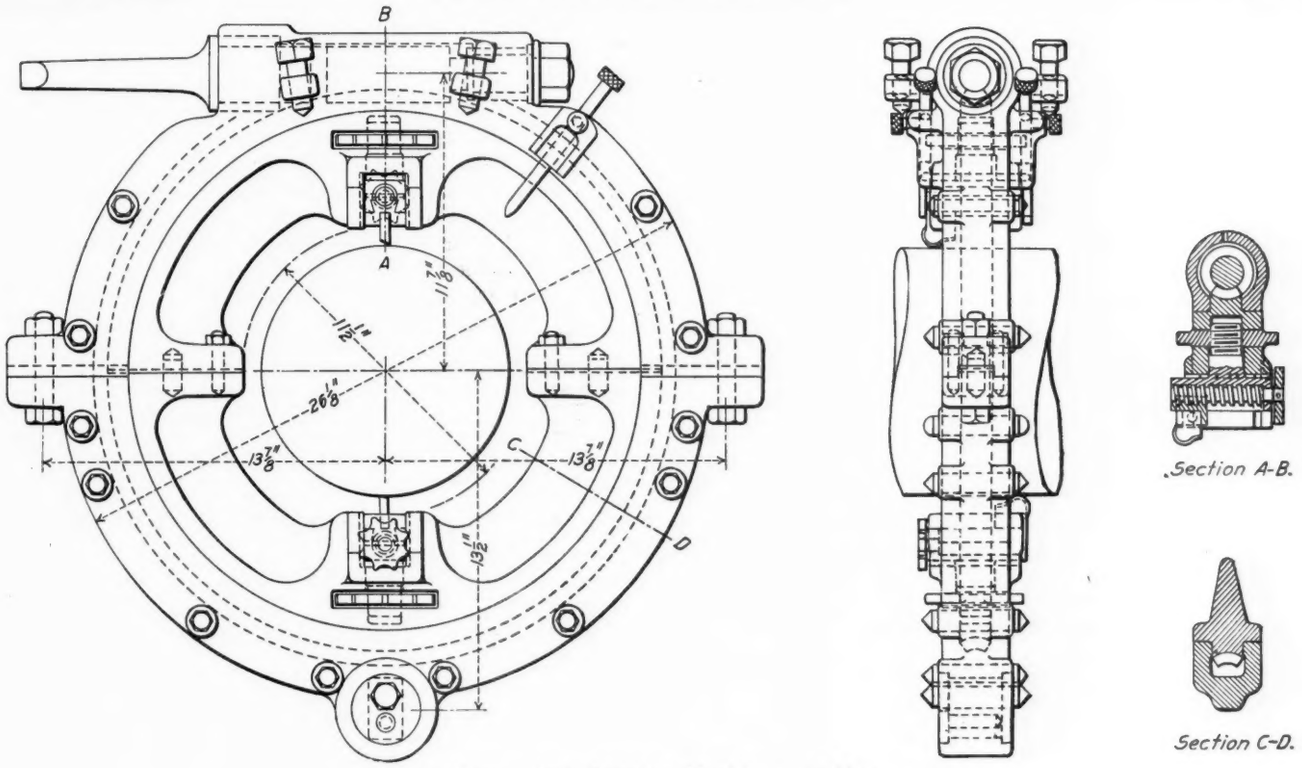
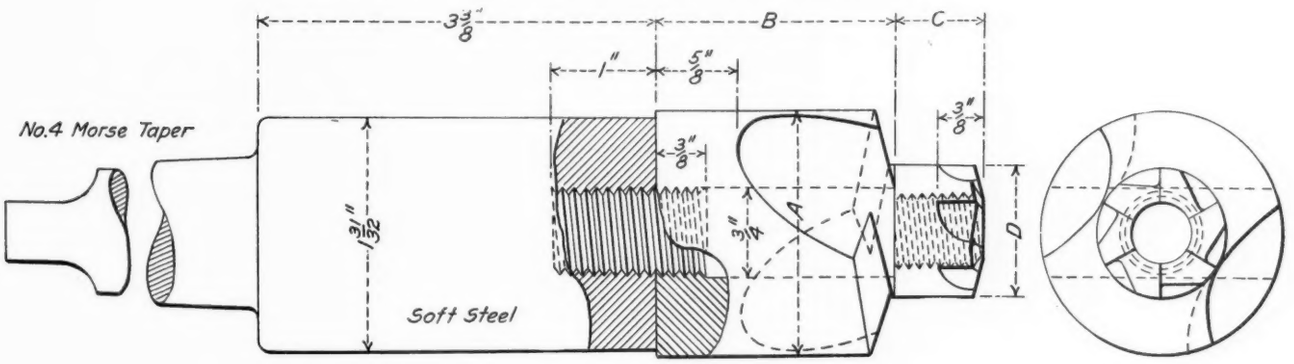
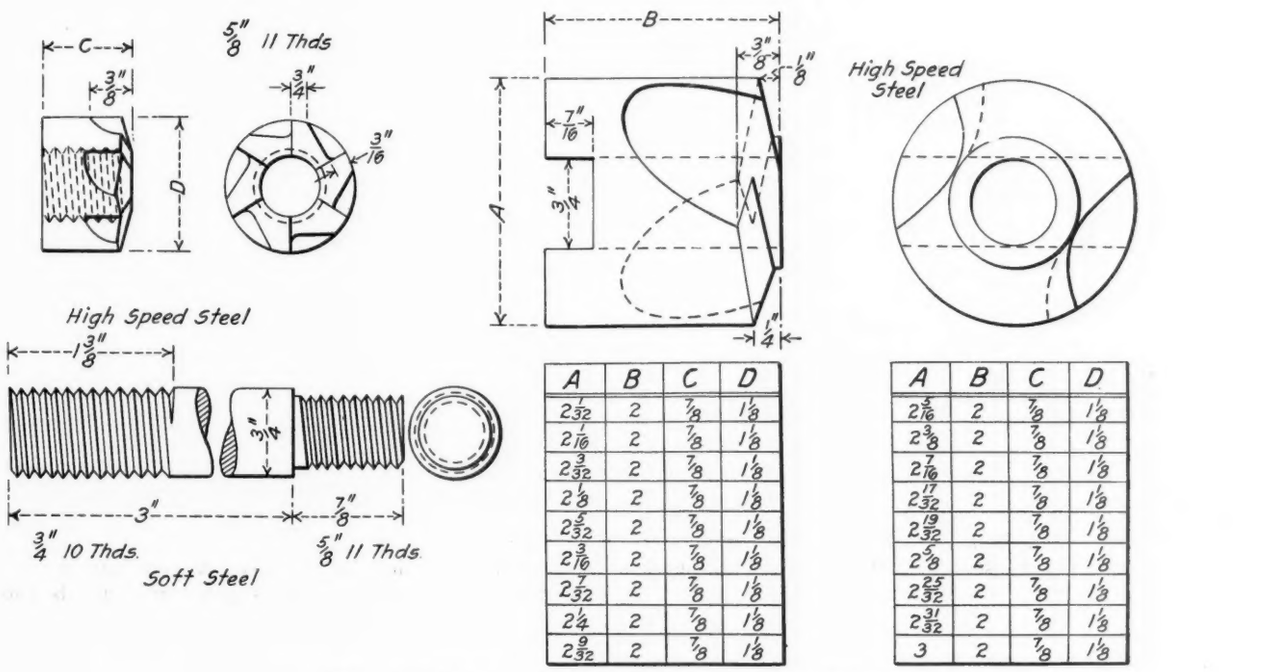


Fig. 4—Crank Axle Turning Machine. McKernan.





A	B	C	D
2 1/32	2	7/8	1 1/8
2 1/16	2	7/8	1 1/8
2 3/32	2	7/8	1 1/8
2 1/8	2	7/8	1 1/8
2 5/32	2	7/8	1 1/8
2 3/16	2	7/8	1 1/8
2 7/32	2	7/8	1 1/8
2 1/4	2	7/8	1 1/8
2 9/32	2	7/8	1 1/8

A	B	C	D
2 5/16	2	7/8	1 1/8
2 3/8	2	7/8	1 1/8
2 7/16	2	7/8	1 1/8
2 17/32	2	7/8	1 1/8
2 19/32	2	7/8	1 1/8
2 5/8	2	7/8	1 1/8
2 25/32	2	7/8	1 1/8
2 31/32	2	7/8	1 1/8
3	2	7/8	1 1/8

Fig. 7—High-Speed Flue-Sheet Cutter. McKernan.

crank is very liable to be out of quarter and the original throw changed.

The crank pin turning machine will finish a bearing in from five to six hours, turning the pin exactly round and in exact quarter and throw. The sketch shows the construction of the machine. It consists of a two-piece annular worm gear enclosed in an outer case. An air motor drives this gear by means of a worm. Two cutting tools are mounted in the gear body, each cutting from the center outward and fed automatically. The machine has a positive centering device, making adjustment on the crank correct for quarter and throw.

The inside cranks of about 150 balanced compounds are overhauled per year, so the saving made by the use of the machine over the hand method is quite large. The costs of the two methods are as follows:

By hand, per engine	$11.10
By machine, per engine	2.59
Saving by machine, per engine	8.51
Saving by machine, per 150 engines	1,276.51

In addition to this large saving per year the delays to power for crank axle work is reduced 75 per cent. through the use of the machine.

WHEEL LATHE TOOL HOLDER.

Fig. 6 illustrates a wheel lathe tool holder designed to use smaller and more efficient cutting tools than the old solid bar tools. The holders are made of cast steel and take 1¼-in. square high-speed roughing tools and ¾-in. flat flanging and finishing tools. The holders and tools are clamped in the tool posts in the ordinary manner.

With the old-style solid tools each machine was equipped with a set of tools weighing from 125 to 150 lbs. By the use of the tool holder and smaller tools the amount of tool steel per machine has been reduced from 150 to 20 lbs., or in cost from approximately $90 to $12. With 25 wheel lathes in operation the total saving in tool steel tied up for this purpose amounts to $1,950 per year. In addition to the great economy of the holder and smaller tools the ease of forging and grinding make them much more satisfactory and convenient for shop use.

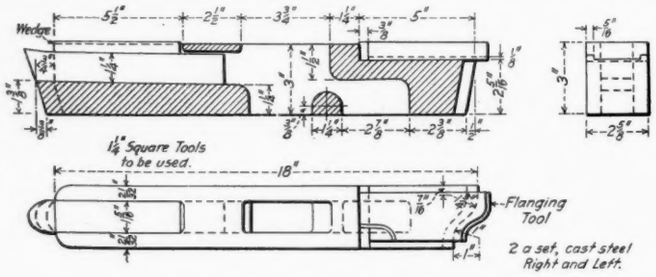
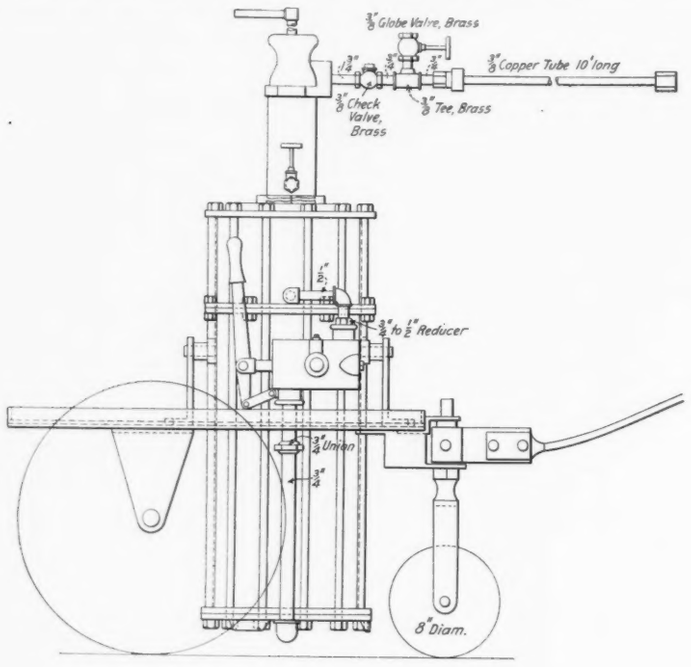
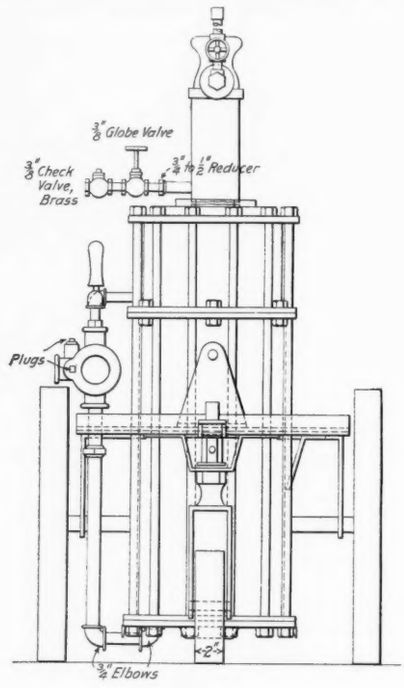


Fig. 6—Wheel Lathe Tool Holder. McKernan.

HIGH-SPEED FLUE-SHEET CUTTER.

Fig. 7 illustrates a high-speed flue-sheet cutter with soft steel arbor for drilling flue holes in flue sheets on drill press.





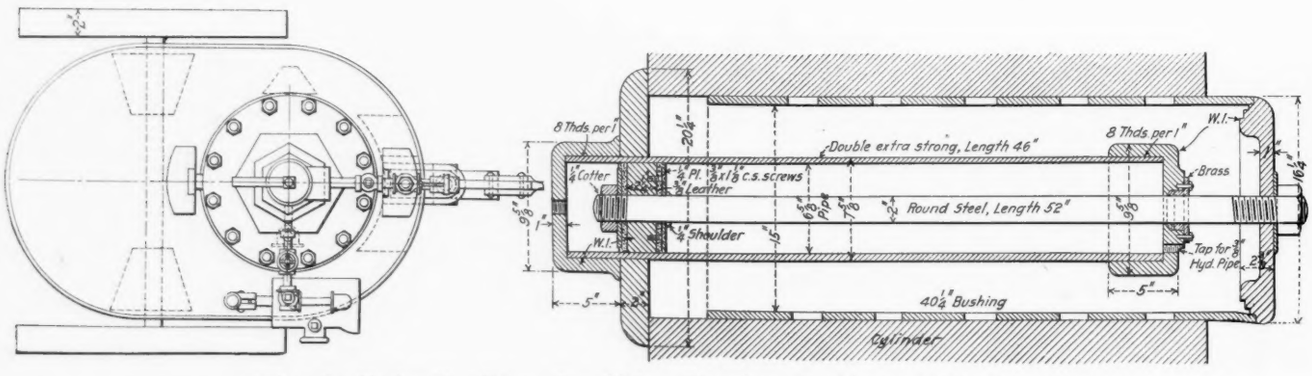


Fig. 8—Hydraulic Press for Valve Chamber Bushings. McKernan.

The cutter has two cutting faces similar to a twist drill. A carbon steel rose bit cutter serves as a nut to hold the cutter on the arbor. This cutter reams out the punched holes to $1\frac{3}{16}$ in., and centers the cutter.

The use of this cutter has been attended with great economy and efficiency. With the old-style cutter 15 holes were drilled per hour, at a cost of 1.33 cents per hole, on the basis of labor at 20 cents per hour. With the new cutter the same operator drills 60 holes per hour, at a cost of .33 cents per hole. This is a reduction in cost of 1 cent per hole, or 75 per cent. The total saving per year by the use of this cutter is $522 over the old methods.

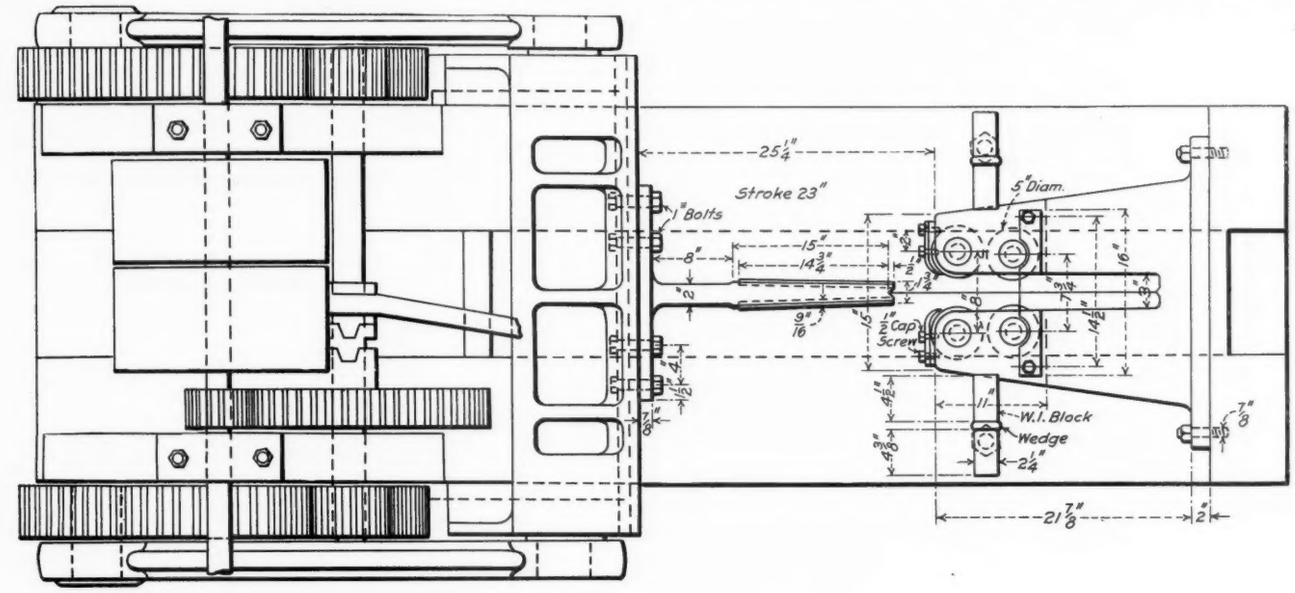
HYDRAULIC PRESS FOR VALVE CHAMBER BUSHINGS.

Fig. 8 shows a hydraulic press for pressing in or removing valve chamber bushings. The piston of the ram is forced out by hydraulic pressure carried from a portable accumulator through a copper pipe. This gives a high, even pressure that applies or removes bushings quickly.

It formerly required a mechanic and helper 6 hours to apply a bushing with the old methods in vogue. The cost of this operation was $3.24, or $6.48 per engine, when 2 bushings were applied. By the use of the hydraulic press the time of applying a bushing was reduced from 6 to 2 hours, making a saving of $2.16 per bushing, or $4.32 per engine. An average of 240 bushings are applied per year, which, at a saving of $2.16 apiece, makes a total saving of $518.40 by the use of this device.

TWO BRAKE-SHOE KEY DEVICES.

Figs. 9 and 10 illustrate two special devices designed by the general blacksmith foreman of the Topeka shops used for forging and finishing brake-shoe keys out of old scrap iron. The first device is an attachment to the bulldozer for



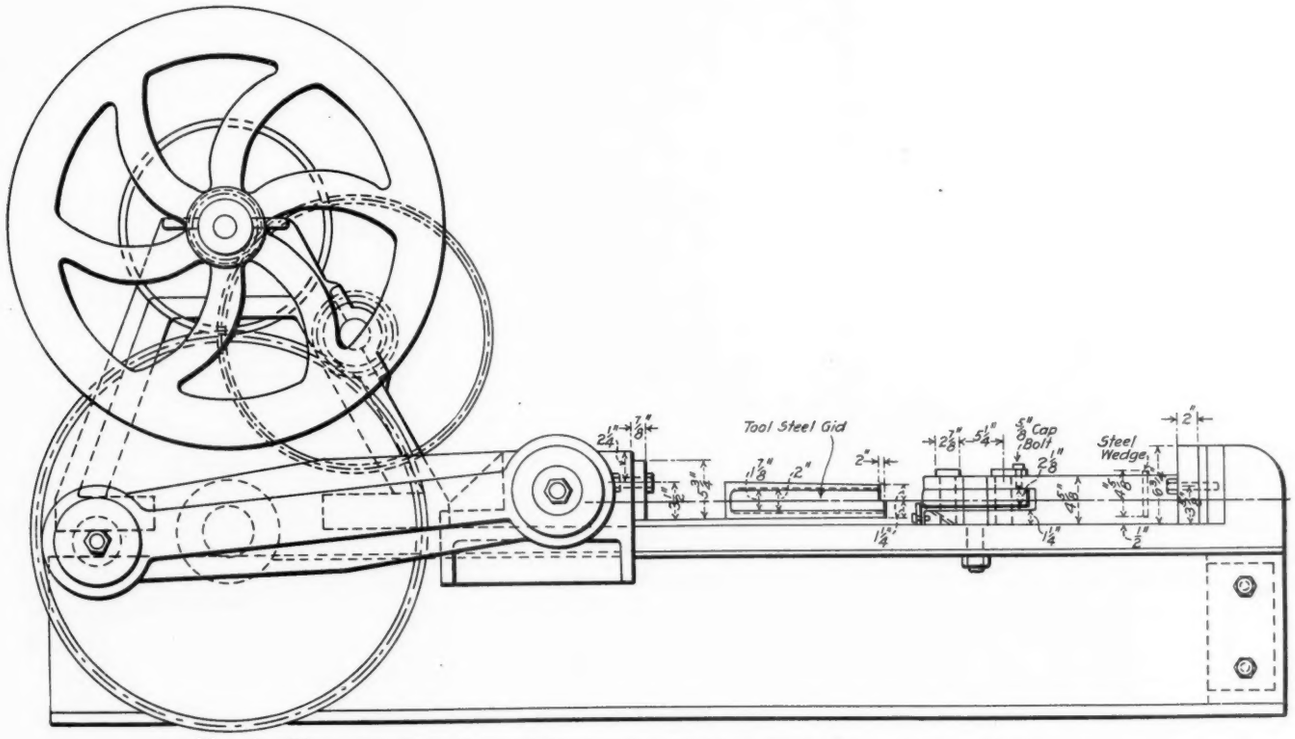


Fig. 9—Plan and Elevation of Device for Making Brake-Shoe Keys. McKernan.

forging the key to shape. Two keys are forged at one time in one operation. These are cut apart and bent to shape in one operation by the shear attachment to a power punch or shears.

These devices have proved very economical. Keys were formerly forged by hand at the rate of about 250 per day and at a cost of 16 cents each. By the use of the devices shown an output of 3,000 to 3,500 keys per day is maintained with the same labor at a cost of 1¼ cents per day. About 125,000 of these keys are made and used per year, so that comparing the cost of machine and hand methods, $18,418 is saved by the use of the devices shown.

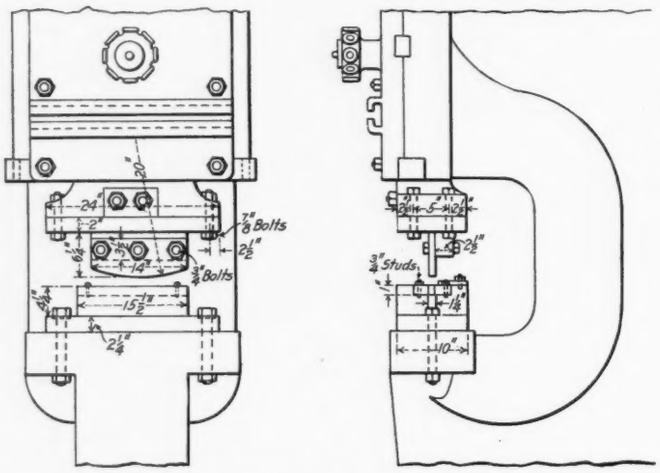


Fig. 10—Device for Making Brake-Shoe Keys. McKernan.
As applied to power shears for shearing and bending keys after forging.

All these tools and devices are in every-day service in our shops as part of the regular equipment. The results shown and the savings made are well established. In conjunction with the economies obtained through the use of many other special devices and methods greater output has been secured from our shops at much less cost. The information furnished was obtained through personal experience with the devices mentioned.

THIRD COLLECTION.

BY F. S. ROBBINS,
Inspector, Pennsylvania Railroad; Renovo Shops.

AIR-PUMP REPAIR STAND.

The use of this stand greatly facilitates the making of repairs to an air-pump. Pumps undergoing repairs are lifted upon the stand and bolted to the table. This table can be tilted 45 deg. from the horizontal in either direction. There

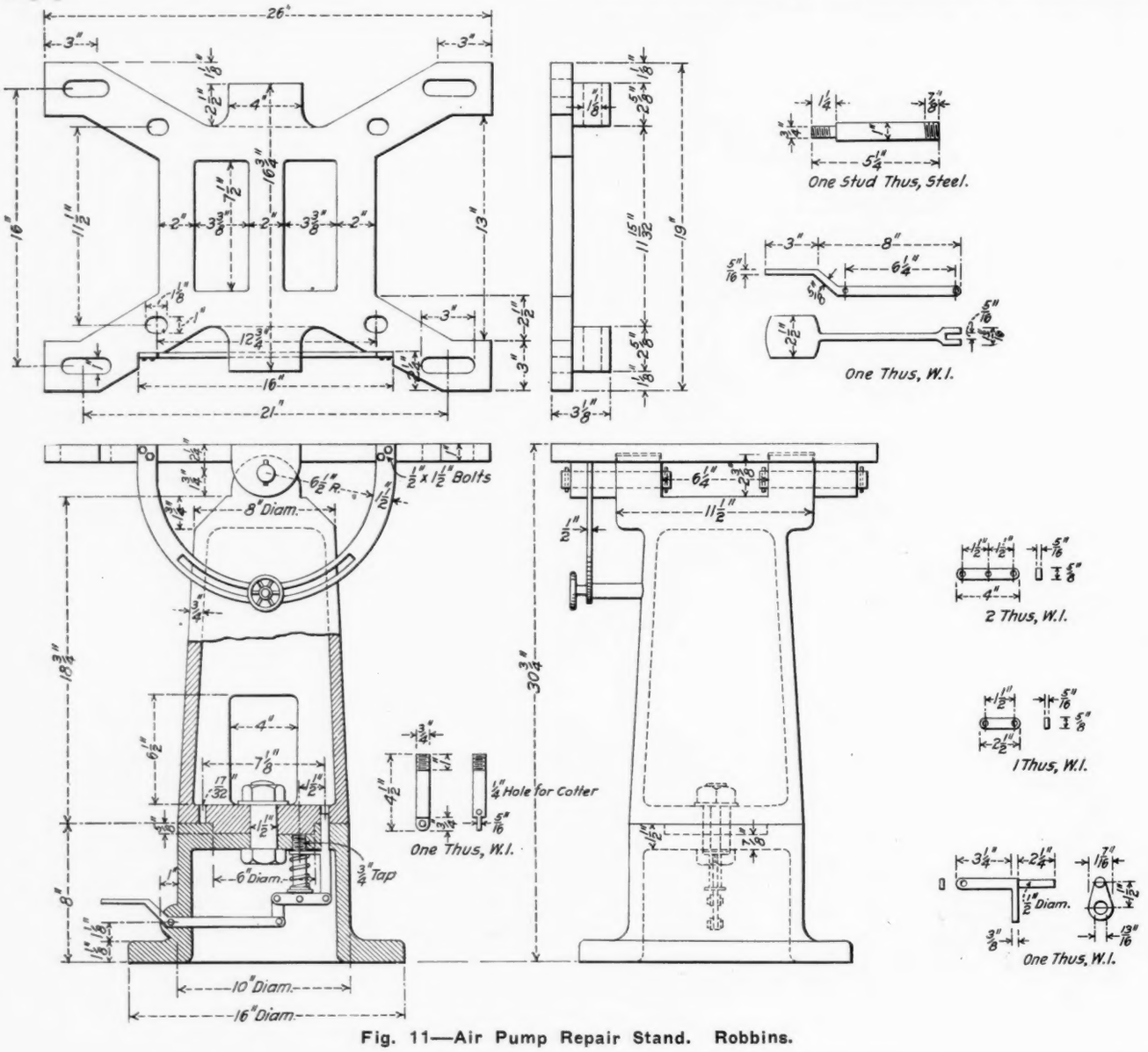


Fig. 11—Air Pump Repair Stand. Robbins.

is a center pin in the pedestal which allows the top to turn on the base; the lock lever is operated by the workman's foot. With this stand the workman is always near his tools, as his position practically does not change, each cylinder being brought into position as desired.

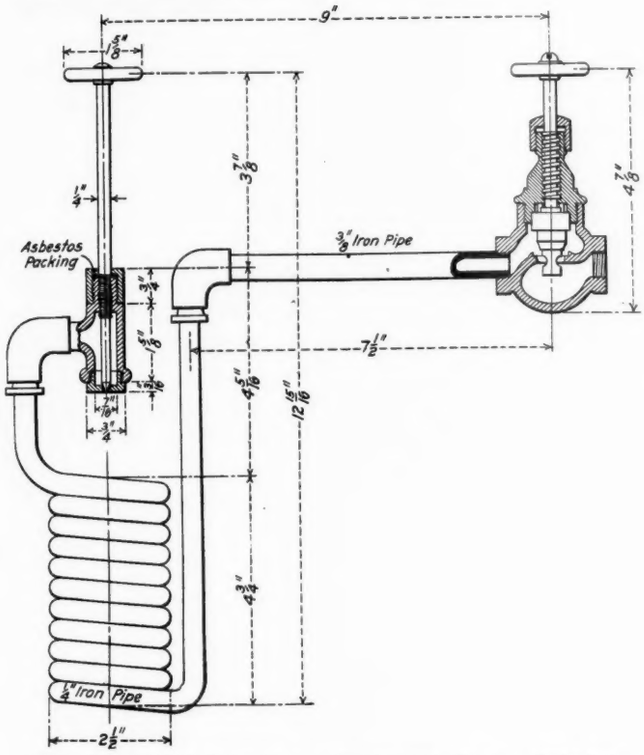


Fig. 12—Paint Burner for Passenger Cars. Robbins.

PAINT BURNER.

This burner is designed to use kerosene oil, so as to eliminate dangerous gasolene burners from the shop buildings. A reservoir for the oil supply is connected to an air line for the necessary pressure for operation. As many burners as are desired can be used from the one reservoir supply. These burners are very effective and are much preferred by the workmen to the gasolene torch. Beside the elimination of danger in the fuel, the burner is much lighter in weight and the fatigue to the workmen is greatly lessened.

TABLE OF RATES.

These tables are made up of the different hourly rates of wage paid at the shop, there being as many tables as there are rates. The foreman is supplied with as many rate sheets as he has rates of wages to be paid the men on his rolls. The time saved by such a handy "kink" as this is very large, and is perhaps of as much or more value than some of the mechanical "kinks" used in the shops. In the shop clerk's office these rate sheets are now indispensable.

HOOK FOR HANDLING SHEET METAL.

This arrangement is primarily a safety device, although it is a decided time-saver when it is necessary to fasten the sheet firmly to the supports when punching or shearing. The eccentric action of the hook plate gives a firm hold on the sheet and is instantly released when the weight of the sheet is taken off the crane chains.

ECCENTRIC CRANK ARM REMOVER.

This device finds its usefulness as great on the road as in the shops, for when carried by the wreck crews or kept at telegraph towers it immediately proves its worth when an engine must be disconnected. The shell is laid on the crank pin and the wedge inserted between the eccentric crank arm and shell.

P. R. R., ERIE DIVISION—WESTERN DIVISION—RENOVO SHOPS.
Table of Rates—$0.169 Per Hour.

No. R—977. Sheet C.

1		50		100		150		200		250		300		350	
Hrs.	Amount.	Hrs.	Amount.	Hrs.	Amount.	Hrs.	Amount.	Hrs.	Amount.	Hrs.	Amount.	Hrs.	Amount.	Hrs.	Amount.
1	$0.169	51	$8.619	101	$17.069	151	$25.519	201	$33.969	251	$42.419	301	$50.869	351	$59.319
2	.338	2	8.788	2	17.238	2	25.688	2	34.138	2	42.588	2	51.038	2	59.488
3	.507	3	8.957	3	17.407	3	25.857	3	34.307	3	42.757	3	51.207	3	59.657
4	.676	4	9.126	4	17.576	4	26.026	4	34.476	4	42.926	4	51.376	4	59.826
5	.845	5	9.295	5	17.745	5	26.195	5	34.645	5	43.095	5	51.545	5	59.995
6	1.014	6	9.464	6	17.914	6	26.364	6	34.814	6	43.264	6	51.714	6	60.164
7	1.183	7	9.633	7	18.083	7	26.533	7	34.983	7	43.433	7	51.883	7	60.333
8	1.352	8	9.802	8	18.252	8	26.702	8	35.152	8	43.602	8	52.052	8	60.502
9	1.521	9	9.971	9	18.421	9	26.871	9	35.321	9	43.771	9	52.221	9	60.671
10	1.690	60	10.140	110	18.590	160	27.040	210	35.490	260	43.940	310	52.390	360	60.840
1	1.859	1	10.309	1	18.759	1	27.209	1	35.659	1	44.109	1	52.559	1	61.009
2	2.028	2	10.478	2	18.928	2	27.378	2	35.828	2	44.278	2	52.728	2	61.178
3	2.197	3	10.647	3	19.097	3	27.547	3	35.997	3	44.447	3	52.897	3	61.347
4	2.366	4	10.816	4	19.266	4	27.716	4	36.166	4	44.616	4	53.066	4	61.516
5	2.535	5	10.985	5	19.435	5	27.885	5	36.335	5	44.785	5	53.235	5	61.685
6	2.704	6	11.154	6	19.604	6	28.054	6	36.504	6	44.954	6	53.404	6	61.854
7	2.873	7	11.323	7	19.773	7	28.223	7	36.673	7	45.123	7	53.573	7	62.023
8	3.042	8	11.492	8	19.942	8	28.392	8	36.842	8	45.292	8	53.742	8	62.192
9	3.211	9	11.661	9	20.111	9	28.561	9	37.011	9	45.461	9	53.911	9	62.361
20	3.380	70	11.830	120	20.280	170	28.730	220	37.180	270	45.630	320	54.080	370	62.530
1	3.549	1	11.999	1	20.449	1	28.899	1	37.349	1	45.799	1	54.249	1	62.699
2	3.718	2	12.168	2	20.618	2	29.068	2	37.518	2	45.968	2	54.418	2	62.868
3	3.887	3	12.337	3	20.787	3	29.237	3	37.687	3	46.137	3	54.587	3	63.037
4	4.056	4	12.506	4	20.956	4	29.406	4	37.856	4	46.306	4	54.756	4	63.206
5	4.225	5	12.675	5	21.125	5	29.575	5	38.025	5	46.475	5	54.925	5	63.375
6	4.394	6	12.844	6	21.294	6	29.744	6	38.194	6	46.644	6	55.094	6	63.544
7	4.563	7	13.013	7	21.463	7	29.913	7	38.363	7	46.813	7	55.263	7	63.713
8	4.732	8	13.182	8	21.632	8	30.082	8	38.532	8	46.982	8	55.432	8	63.882
9	4.901	9	13.351	9	21.801	9	30.251	9	38.701	9	47.151	9	55.601	9	64.051
30	5.070	80	13.520	130	21.970	180	30.420	230	38.870	280	47.320	330	55.770	380	64.220
1	5.239	1	13.689	1	22.139	1	30.589	1	39.039	1	47.489	1	55.939	1	64.389
2	5.408	2	13.858	2	22.308	2	30.758	2	39.208	2	47.658	2	56.108	2	64.558
3	5.577	3	14.027	3	22.477	3	30.927	3	39.377	3	47.827	3	56.277	3	64.727
4	5.746	4	14.196	4	22.646	4	31.096	4	39.546	4	47.996	4	56.446	4	64.896
5	5.915	5	14.365	5	22.815	5	31.265	5	39.715	5	48.165	5	56.615	5	65.065
6	6.084	6	14.534	6	22.984	6	31.434	6	39.884	6	48.334	6	56.784	6	65.234
7	6.253	7	14.703	7	23.153	7	31.603	7	40.053	7	48.503	7	56.953	7	65.403
8	6.422	8	14.872	8	23.322	8	31.772	8	40.222	8	48.672	8	57.122	8	65.572
9	6.591	9	15.041	9	23.491	9	31.941	9	40.391	9	48.841	9	57.291	9	65.741
40	6.760	90	15.210	140	23.660	190	32.110	240	40.560	290	49.010	340	57.460	390	65.910
1	6.929	1	15.379	1	23.829	1	32.279	1	40.729	1	49.179	1	57.629	1	66.079
2	7.098	2	15.548	2	23.998	2	32.448	2	40.898	2	49.348	2	57.798	2	66.248
3	7.267	3	15.717	3	24.167	3	32.617	3	41.067	3	49.517	3	57.967	3	66.417
4	7.436	4	15.886	4	24.336	4	32.786	4	41.236	4	49.686	4	58.136	4	66.586
5	7.605	5	16.055	5	24.505	5	32.955	5	41.405	5	49.855	5	58.305	5	66.755
6	7.774	6	16.224	6	24.674	6	33.124	6	41.574	6	50.024	6	58.474	6	66.924
7	7.943	7	16.393	7	24.843	7	33.293	7	41.743	7	50.193	7	58.643	7	67.093
8	8.112	8	16.562	8	25.012	8	33.462	8	41.912	8	50.362	8	58.812	8	67.262
9	8.281	9	16.731	9	25.181	9	33.631	9	42.081	9	50.531	9	58.981	9	67.431
50	8.450	100	16.900	150	25.350	200	33.800	250	42.250	300	50.700	350	59.150	400	67.600

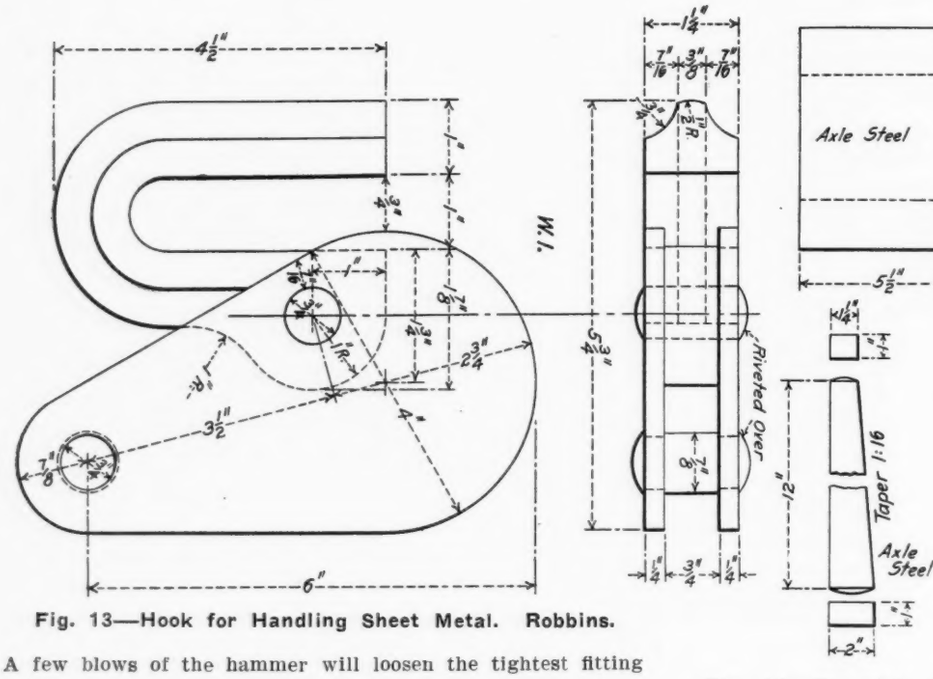


Fig. 13—Hook for Handling Sheet Metal. Robbins.

A few blows of the hammer will loosen the tightest fitting crank arm.

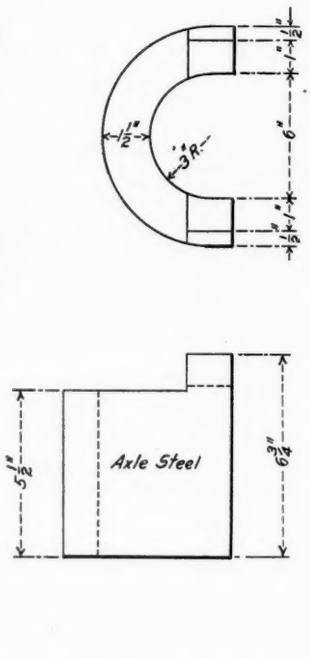


Fig. 14—Eccentric Crank Arm Remover. Robbins.

FOURTH COLLECTION.

BY A. L. BAUER,
Foreman Machine Shop, Terminal Railroad Association of St. Louis.

HYDRAULIC PRESS FOR DRIVING BOX BRASSES AND ROD BUSHINGS.

This device is shown in Fig. 15.

COUNTERBORING TOOL.

This tool may also be used for boring. It is designed for use in connection with drill presses and lathes.

BORING BAR.

Fig. 17 shows a boring bar for use in the boring mill. Any size bar can be applied without removing the socket.

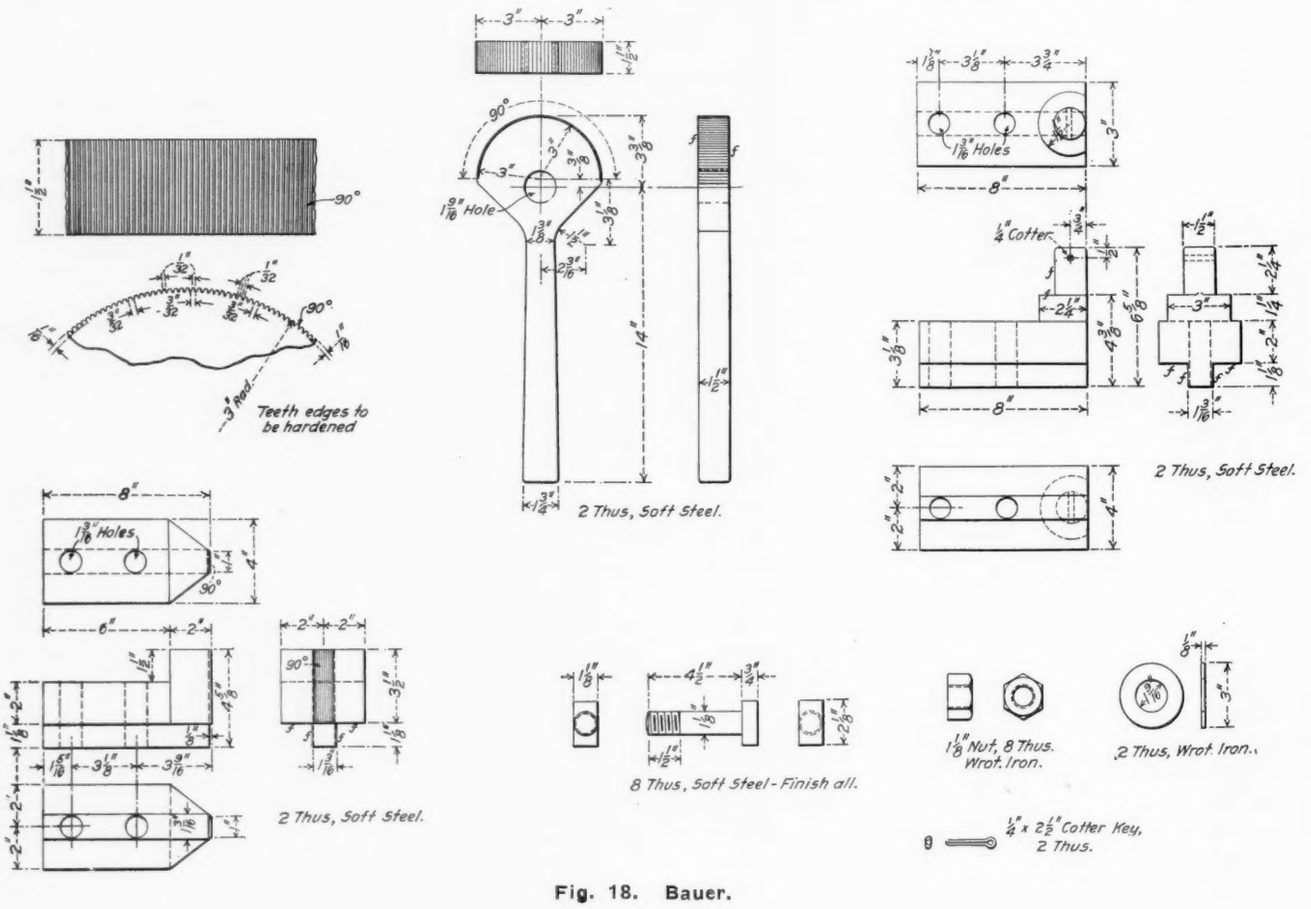
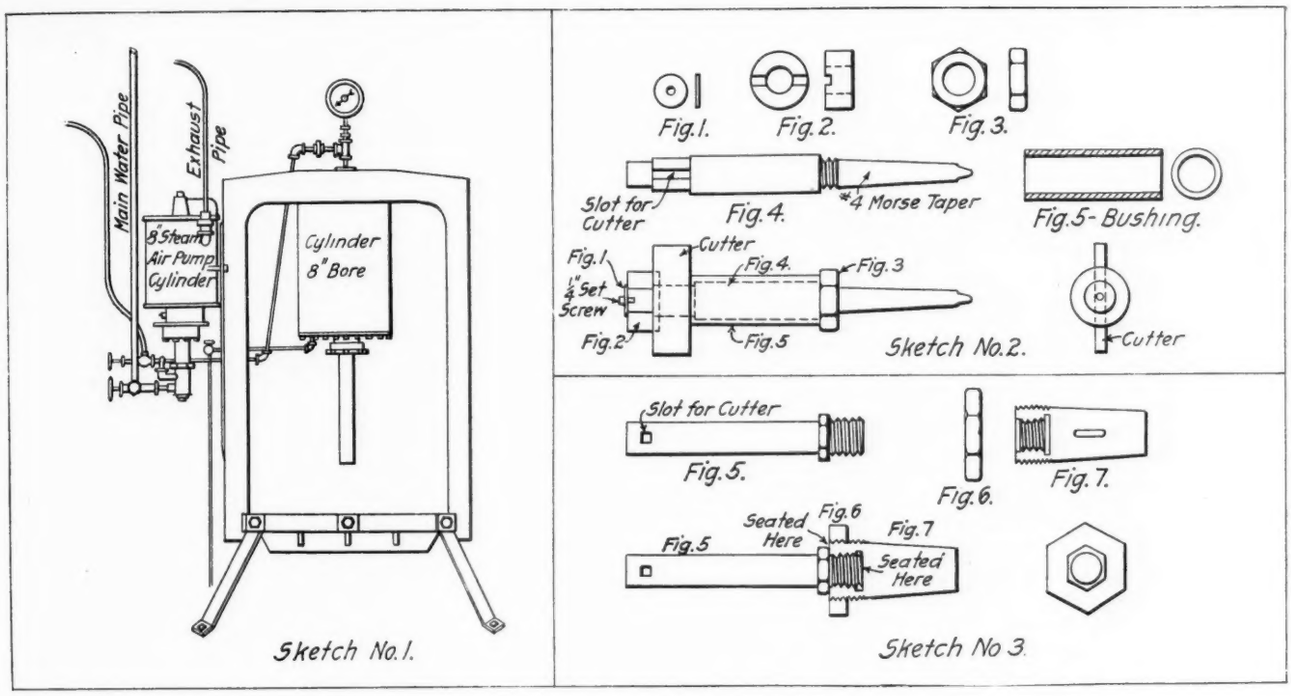


Fig. 18. Bauer.



Figs. 15, 16 and 17. Bauer.

TIRE CHUCKS.

Fig. 18 shows the details of tire chucks used on a boring mill for boring and facing tires.

FIFTH COLLECTION.

BY J. E. OSMER.

Master Mechanic, Northwestern Elevated Railroad.

I.

ADAPTING AN OLD WHEEL LATHE TO HEAVY WORK.

Some few years ago, at a time when the company that I am with did not feel the necessity of purchasing a new wheel lathe outright, it was decided to secure a second-hand machine of such proportions as would successfully do our work.

The machine purchased was made in 1886, and had been sold to a concern in this city after years of service at scrap value. The parts were collected together as well as possible and assembled at the shops where it is now in daily operation.

It was found that numerous parts were missing, there being no teeth on one of the drive heads, the teeth entirely missing from one of the main driving pinions and other parts in a very similar condition. The machine was assembled as far as possible; the power, which at that time was a 10-h.p. motor, was turned on, and what remained of the teeth on one head were turned off. A pattern was made for a circular rack, which was later made and bolted to this head. A pattern was also made for the pinion, which was made of steel, and the machine soon put in operation. The output was four pairs of 34-in. wheels per day.

Recently the requirements were somewhat greater and a 20-h.p. motor was applied, which gives us a speed of 22 feet per minute on a 34-in. wheel, with a $\frac{3}{8}$-in. feed. Because the main bearings were badly worn, and because of the increased speed, a great chattering took place. To eliminate this the machine is run in the direction for which it was designed for the rough cut. For the finishing cut two tools are used. One is a flat tool for finishing the tread and the other is a flange tool. In making these last cuts the machine is put in reverse motion by a double pole, double throw switch. The tools in mention tend to hold the heads of the machine down in their bearings, thereby eliminating chattering, with an output of eight pairs of wheels per day at present.

A pair of wheels was taken from the floor, turned and replaced upon the floor again in 41 minutes.

The method used in lifting the wheels to be turned is by means of a bar laid in forks which are placed in the grooves of the heads and a pair of hooks suspended therefrom and hooked over the axle. The machine is then set in motion, which elevates the wheels to the desired height, after which the movable head is set in position and the machine reversed and the lifting bar and hooks automatically dropped to the floor while the machine is in reverse motion.

ASSEMBLING WHEELS AND AXLES.

To eliminate any possibility of doubt as to the proper fit required in assembling wheels and axles, this company has outlined rules for making the same.

The axle-lathe man uses a method of caliper application

O. D. N.—Form 38. 1M. 4-07.

NORTHWESTERN ELEVATED RAILROAD COMPANY.

KIMBALL AVE. SHOPS. WILSON AVE. SHOPS.

ASSEMBLY RECORD OF WHEELS, AXLES AND TIRES.

Prefix ⊕ if New.
Prefix ⊖ if Remounted. _____ 190__

○ WHEELS		○ AXLES		○ TIRES
No.	Pressure	Material	Make	Make
No.	Pressure	Material	Diam. of Jour.	Thick

NOTE.—Shrinkage of Tire to be 1-100" to the foot; 6 13-16" Gear Fit; 30 tons pressure; 3-16" Caliper Drag.
CAST IRON COACH WHEEL CENTER: 4" Wheel Fit; 50 to 60 tons pressure; 9-16" Caliper Drag.
CAST IRON MOTOR CAR WHEEL No. 2 END: 5⅛" Wheel Fit; 60 to 70 tons pressure; 13-16" Caliper Drag.
CAST STEEL COACH WHEEL: 4" Wheel Fit; 60 to 70 tons pressure; 5-16" Caliper Drag.
CAST STEEL MOTOR CAR WHEEL: 6⅝" Wheel Fit; 75 to 90 tons pressure. 7-16" Caliper Drag.

CORRECT: _____ Pressman.

CORRECT: _____ Foreman.

Fig. 19—Assembly Formula. Osmer.

by dragging one leg of the caliper a certain distance over the wheel seat, to predetermine the ton fit, as follows:

If the bore of the hub is 6 in. and the length of the hub is 8 in. these lengths added together give a total of 14 in. Allowing $\frac{1}{32}$ in. for each inch in diameter and $\frac{1}{32}$ in. for each inch longitudinally gives a total of $\frac{14}{32}$ in., which is the drag of one leg of the caliper.

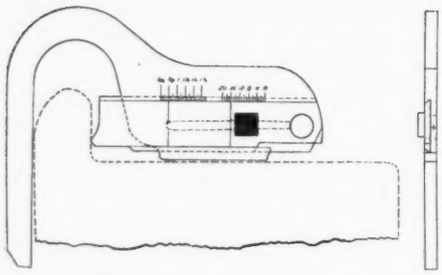


Fig. 20—Gage. Osmer. Side and End View.

The thickness of the worn flange is determined by reading the left graduations from left to right by $\frac{1}{32}$ in. Depth of cut is determined by reading right graduations from right to left by $\frac{1}{32}$ in.

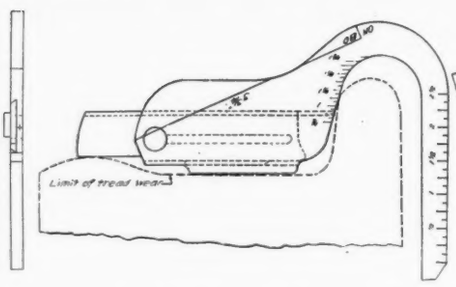


Fig. 21—Gage. Osmer.

height of flange by $\frac{1}{16}$-in., and limit of tread height of flange by $\frac{1}{16}$ in., and limit of thread wear.

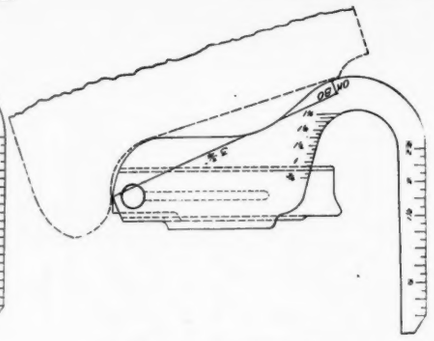


Fig. 22—Gage. Osmer.

This gage measures shelled wheels and flat spots, by $\frac{1}{16}$ in. It also determines the condition of a wheel having a broken rim.

The object of limiting the fit to $\frac{1}{32}$ in. is to prevent the reversing of the fiber in the wheel or axle when the same are dismantled, thereby ruining the fit for future applications and disturbing the sizes of both the wheel seat and the wheel bore, and at the same time insure a perfect fit.

Two parallel lines are drawn longitudinally upon the wheel seat the prescribed amount the leg of the caliper is to be drawn, and upon these lines the legs of the calipers should intersect.

The formula, Fig. 19, is used by our company in carrying on this work.

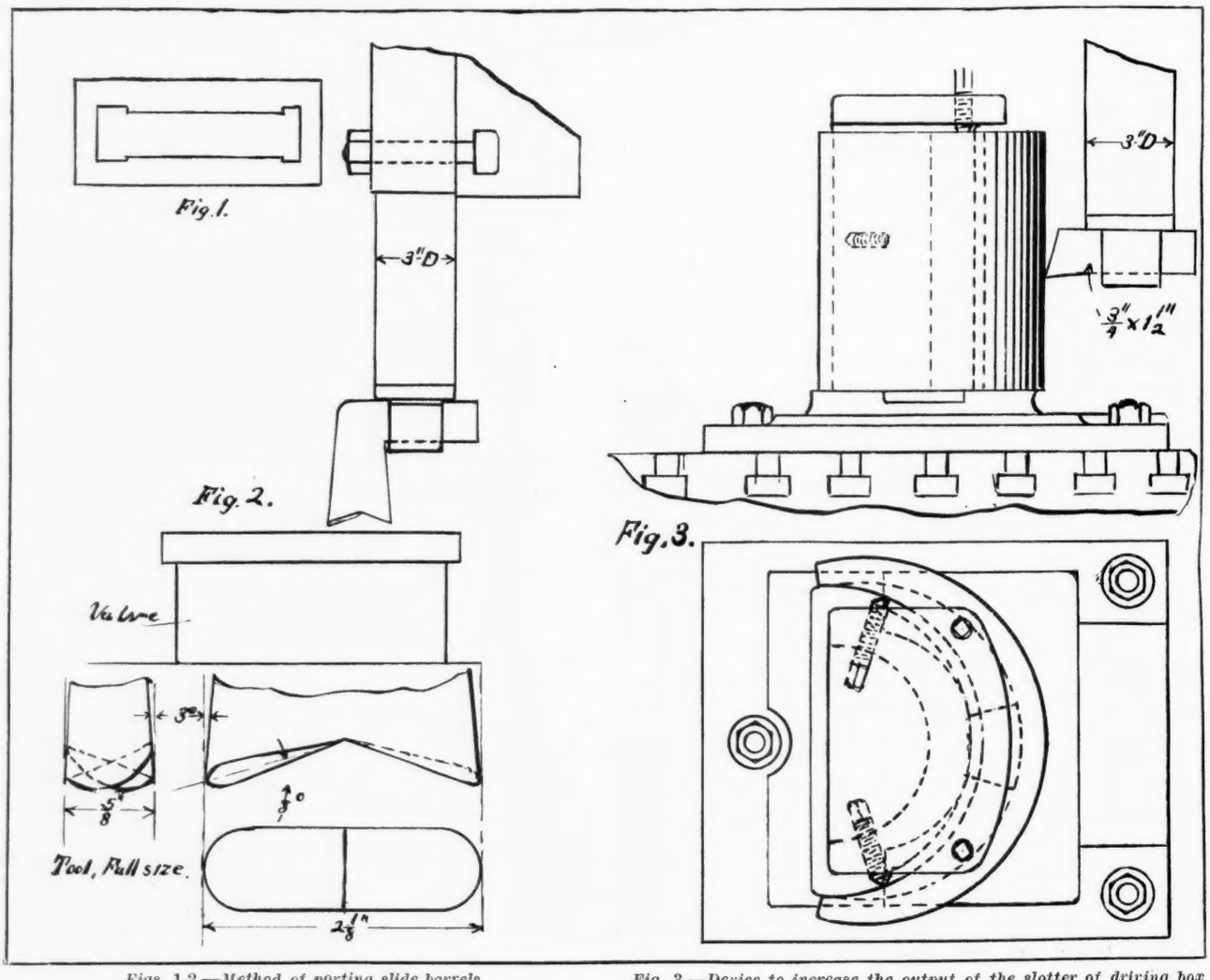
GAGE FOR TURNING TIRES AND PREDETERMINING TREAD WEAR.

The unnecessary waste of steel in turning tires warrants the use of a gage that predetermines the depth of the cut to be taken without waste of material, and at the same time gives a sufficient depth of cut to bring the wheel up to a true contour.

The gage also shows a method of predetermining the limit of tread wear, also a reading for measuring the vertical flange wear and the height of flange is also incorporated.

A method of determining the amount of breakage from the rim of a wheel which is permissible, according to the Master Car Builders' rules, is also contained within this gage.

Wheel inspectors have found this gage of great value for



Figs. 1-2.—Method of porting slide barrels.

Fig. 3.—Device to increase the output of the slotter of driving box brasses.

Fig. 23. Rattek.

their use, and the wheel-lathe man uses it, as heretofore mentioned.

QUICK METHOD OF REMOVING CAR BODIES.

A quick method of removing car bodies from their trucks at the rip or repair track is the use of two air cylinders suspended on either side of the track, of sufficient height to permit the car being raised high enough to run the truck out.

In this company's yard are two 14-in. air cylinders, suspended from the rigid steel structure. A car is run in on the repair tracks, the lifting hooks are placed under the side sills and in less than one minute from the time the rope, which is attached to the air valve that admits air to the cylinders, is pulled the car body is raised and the truck rolled out. This has been found to be a very economical and safe method of raising car bodies without the use of jacks.

GETTING WEAR OUT OF TRIPLE VALVES.

With the use of the graduated release, quick recharge triple valves, on account of the numerous operations of the pistons and the valves in graduating off the brakes, there is the possibility of a trifle more wear than is ordinarily experienced with the old-style triple valves.

Our practice is at regular intervals to remove the triple valves from the cars and take them to the shop, where, by the use of a small, square stick and a piece of fine emery cloth, the unevenness is very soon removed, after which the triple valve is placed upon a rack in close reach of the repairman. On the rack is a part of an old boiler feed steam pump, which is connected to the air-supply pipes of the shop by means of a connecting link to the slide valve, and the face and seat are finished by grinding in oil by the operation of the portion of the steam pump, as heretofore mentioned, which greatly reduces the cost of triple valve repairs, and at the same time brings the valve and seat to a fine finish.

SIXTH COLLECTION.

BY FRANK RATTEK,
Brighton, Mass.

METHOD OF PORTING SLIDE BARRELS.

The ordinary method of cutting the ports in the valve faces is to notch out at each end of the port, as shown on Fig. 1,

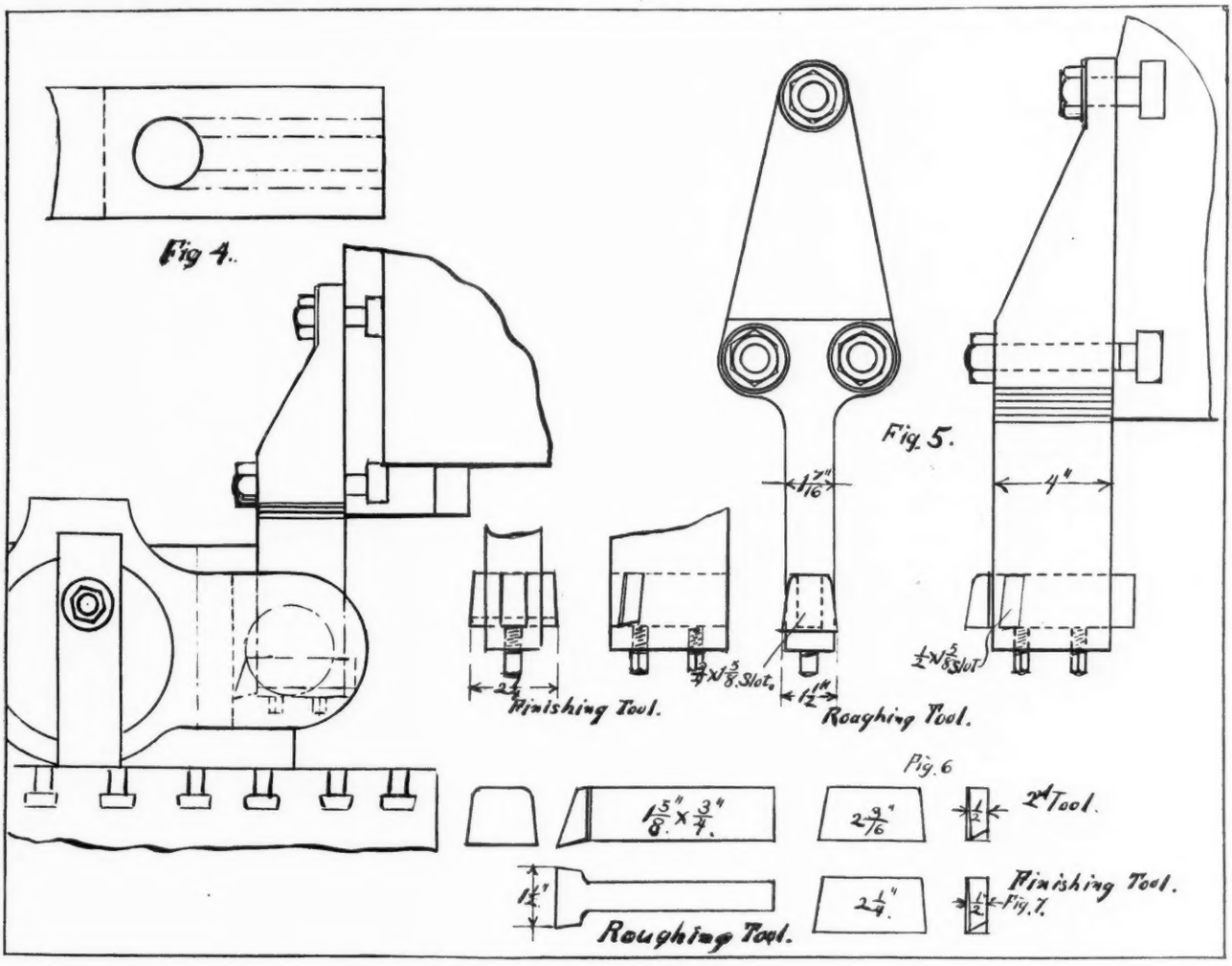


Fig. 24. Rattek.

and then plane the distance between with an ordinary planer, the notches serving as points for the outrun of the tool in each direction. An improved method on this is to use the tool shown in Fig. 2, which is double pointed and cuts on either side. This is put in a slotting machine and cuts out about $\frac{1}{16}$ in. of metal on each side. The tool is then run into the lime and the feed thrown in one cut on each side, with $\frac{1}{16}$-in. feed, and with it it is necessary to use plenty of soda water. The time required for the work ordinarily is from 15 to 20 minutes, which is less than the time taken for cutting the four notches, while with the latter system from one-half to an hour was spent in finishing the valve to the planer.

METHOD OF FINISHING DRIVING BOXES.

In Fig. 3 the method is shown by which the output of the driving box brasses in the slotter was greatly increased. The brass is held by a jig and the main idea was to have everything perfectly rigid and then to use a stiff tool in a very

rigid tool post. After the first brass is finished the slides are not disturbed, for it is preferable to cut as many brasses as possible without grinding the tool. The gaging is done by calipering one box that is already finished and then, if it is necessary, move the table in or out to suit the next size.

METHOD OF FORKING SIDE RODS.

There are a number of methods of forking side rods in use. They are frequently drilled at the bottom of the slot and the piece is parted out by running in two cuts, as shown by the dotted line in Fig. 4. Sometimes this is done on a rotary saw, and sometimes on a shaper or planer. These methods appear crude and costly, and in order to improve them a tool post, shown in Figs. 4 and 5, was designed. In this the tool is put in a slotter and the metal cut out as in ordinary slotter work. By using a heavy duty machine no trouble is experienced with even such a wide roughing tool as that shown. The second tool is shown in Fig. 6 and the finishing tool in Fig. 7. By the use of this method and these designs of tools the total time of cutting out the fork has been reduced by one-half.

HIGH-SPEED PISTON RING TOOL.

The tool shown in Fig. 8 was designed for cutting off piston rings in a high-duty lathe. The illustration shows the tool at work parting piston rings, and its construction is exceedingly simple. It consists of a heavy tool post bolted to the carriage, with the cutting-off tools set in and held by set screws in the ordinary way and spaced the proper distance apart to give the right width to the rings when they are separated. The roughing and finishing tools can be used simultaneously inside or out with this type of holder.

TOOL FOR BORING OUT STUFFING BOXES.

In order to avoid the expensive method of boring out stuffing boxes and glands the tool shown in Fig. 9 has been designed. It consists of a boring bar with a slot in the end and a self-centering tool held therein by means of a key. A tool of this type is first used as a roughing tool, and then the inside of the box is finished with a cutter of the standard size, which reams it out at the sides and gives the proper shape at the bottom for the reception of the packing.

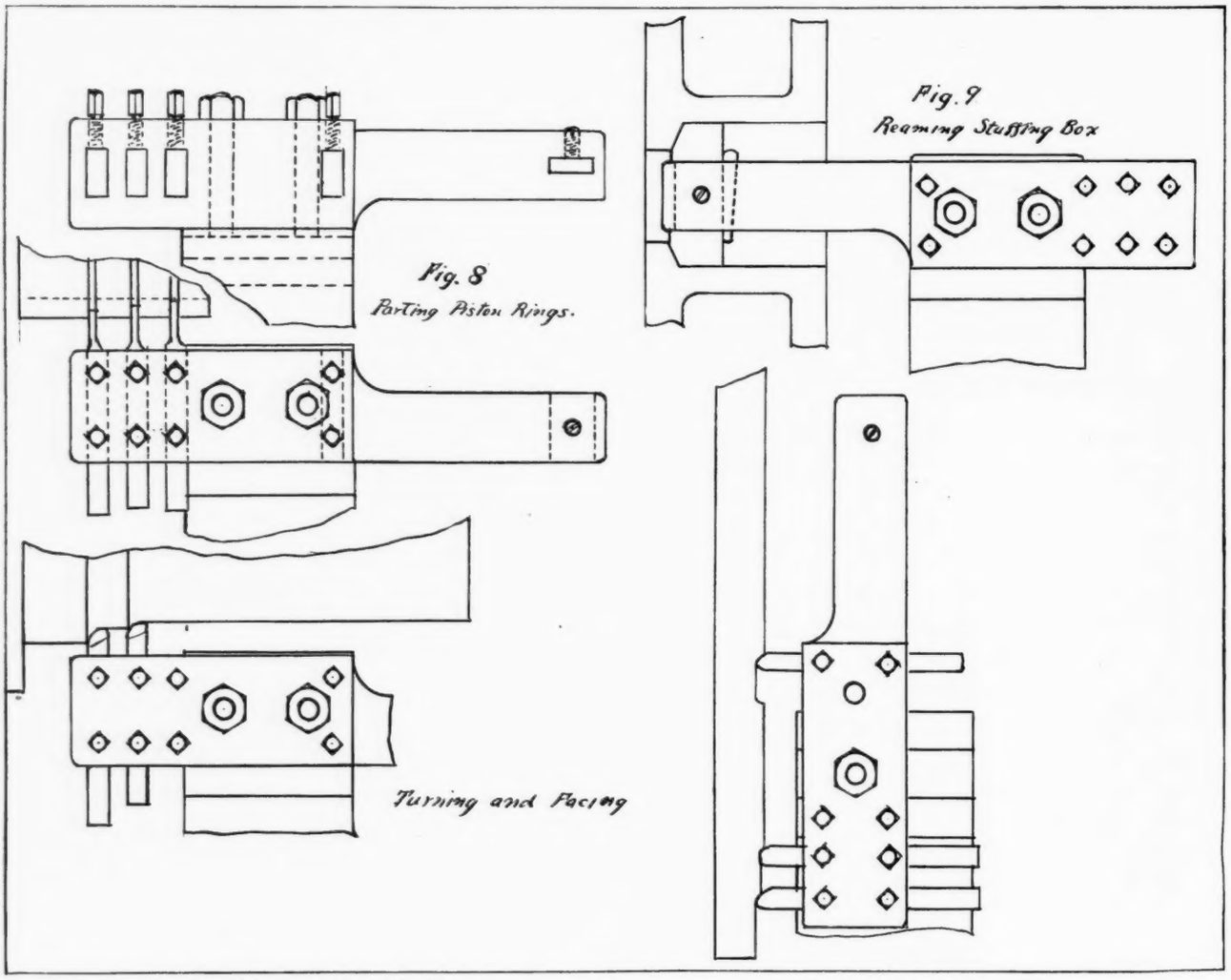


Fig. 8.—High-speed piston ring tool. *Fig. 9.—Stuffing-box reamer.*

Fig. 25. Rattek.

FOREIGN RAILWAY NOTES.

In Prussia a lady was struck on the head and seriously injured by the fall from the baggage net over her head of a piece of baggage placed there by another passenger. She sued for damages and recovered, and the railway administration carried the case up to the highest court and lost in every court.

Russian capitalists are understood to be negotiating for the construction of a railway from Rybinsk (government of Jaroslav) to Obdorsk, in Siberia, 1,260 miles. It is to run through the north Urals and will open up new districts and shorten the route from Siberia to the North sea. The cost is estimated at $65,000,000.

CONSTRUCTION WORK ON THE HARRIMAN LINES.

According to a recent statement of Julius Kruttschnitt of the Harriman lines, the more important extensions of the Union and Southern Pacific systems now under actual construction, aggregate 2,000 miles and will reach new territory in almost every state through which the lines are to run, and will cause radical ultimate changes of conditions in Mexico. The work calls for an expenditure of about $100,000,000 and was undertaken with the full realization that for some time it would not yield a return commensurate with investment in other fields.

Of the extensions being constructed, 600 miles are in the territory of the Union Pacific. This includes 53 miles of new line in Nebraska, extending the O'Fallons' branch from Hershey to Northport; 35 miles in Kansas, where the Topeka & Northwestern is being extended from Onago to Marysville, and 75 miles of branches under construction in Colorado north of Denver, and east and north from Greeley. In addition to this, 100 miles of double-track are being laid on the main line through Nebraska, between Kearney and North Platte.

On the Oregon Short Line, which runs from Granger, Wyoming, and Ogden, Utah, to West Huntington, Oregon, 199 miles of extensions are nearing completion. A branch from Huntington northward up the Snake river to Homestead, a distance of 58 miles, is about finished, also another branch 16 miles long from Vale, Ore., west, along Willow creek which will serve a newly irrigated section. In Southern Idaho a 75-mile line is being built from Rupert, west, running north of the Snake river, to Bliss, beside other extensions in the same section, including extension from Buhl, west, aggregating 50 additional miles. The Lemhi & Salmon Valley was incorporated recently in Idaho to build from Lewiston, Idaho, southeast to the Little Salmon river, thence east to Salmon, 280 miles, thence south to Cerro Grande, 148 miles, with the following branches: Salmon, southeasterly to Challis, 51 miles; from a point 40 miles north of Cerro Grande, east to Camas, 35 miles. Surveys made by the Minidoka & Southwestern for a line from Twin Falls, Idaho, south to a connection with the Southern Pacific, about 20 miles east of Wells, Nev., or Cobre, 120 miles.

In the territory of the Oregon Railroad & Navigation Co. 191 miles of new line are being graded. In Oregon 46 miles of road are being opened, between Elgin and Joseph, and a branch 130 miles long is under way down the Deschutes River into the central portion of the state at Redmond, while in northern Idaho a line is soon to run from Rockford, on the main line east to a point on Lake Coeur d'Alene, opposite Harrison, 15 miles.

From Centralia, Washington, between Portland and Tacoma on the Northern Pacific, the section recently double-tracked for traffic of the Harriman lines, a branch is being run west to Gray's Harbor, 58 miles. This will ultimately run northward 100 miles to Puget Sound through one of the finest forest sections in the world. The Oregon & Washington, building from Portland, Ore., north to Tacoma and Seattle, Wash., 230 miles, has started track-laying. The terminal at Tacoma involves the building of a tunnel 8,700 ft. long at the entrance to that city from the south. At the present time over 1,400 ft. of this tunnel has been completed, and work is progressing at the rate of 28 ft. a day.

Another tunnel into East Portland, 5,500 ft. long, runs between the Williamette and Columbia rivers. The tracks then cross the Columbia over a steel bridge, running into Vancouver, Wash. At Seattle over eight miles of heavy work are under way between the terminal and points outside the city limits. The finest station on the Pacific coast is to be erected in that city at a cost of over $500,000.

When plans were made to secure terminals in Seattle for the Union Pacific property was secured sufficient to care for all the traffic that would come to the lines in fifty years, assuming the continued growth of the city at the present rate. When the business demands it over a half mile of frontage wide enough to provide plenty of warehouse and trackage room will be available.

Extensions under way on the Southern Pacific total over 400 miles. Of this 173 miles are being added to the Oregon lines. About 16 miles of new construction were necessary to effect an entrance into Portland from lines on the west side of the Williamette Valley. A branch 97 miles long is being pushed through timber lands in Oregon from Hillsboro on the Portland-Albany branch, to the coast. Extensions are being built from Natron, Oregon, southward and from Klamath Falls, northward, involving the present construction of about 60 miles of a line to be 152 miles, which will ultimately connect these two points and form part of a new low grade route between Los Angeles and Portland on the eastern side of the Sierras.

In California the grade of the east-bound track of the Central Pacific is being reduced from 2.2 per cent. to 1.5 per cent. between Roseville and Colfax, the advantage of the old grade being retained on the westbound track. Connection is being made between Redwood City on the coast line, and Niles 16 miles, the line crossing San Francisco Bay at Dumbarton Point by means of a bridge which will avoid the ferriage of trains from the San Joaquin Valley lines entering San Francisco. From Mojave north to Keeler in Southern California a branch 146 miles long is under construction, which also will become part of the low grade Los Angeles-Portland line.

Change of line and double track construction involve about 17 miles of new work from Wells to Deeth, Nevada.

An important new low grade line will be completed so far as the Southern Pacific's share of construction is concerned, with the closing of the gap between Winkelman and San Carlos, Arizona, on the Gila Valley, Globe & Northern about 30 miles. The Southern Pacific will then have a line between Bowie on the main line in the southeastern part of the state, west to Phoenix, from which place the Santa Fe has built to Parker on the Colorado river, at the California boundary. The latter road will begin construction this fall on the link between Parker and Bengal, Cal., which is on a branch of the Southern Pacific running from Mojave to the Needles, California, and leased to the Santa Fe. This will give both roads a low grade line across southern Arizona and California into San Francisco, available for through traffic between the Gulf and the coast and running through country rich in copper mines.

The Goose Lake & Southern was organized to build from Goose Lake, Cal., south to Alturas, from which point there are to be two branches, both running southwesterly, connecting with the Southern Pacific at Vina and at Cottonwood, in all 406 miles.

In Louisiana a line 52 miles long is being built by Morgan's Louisiana & Texas from Lafayette northwest to Port Allen, opposite Baton Rouge.

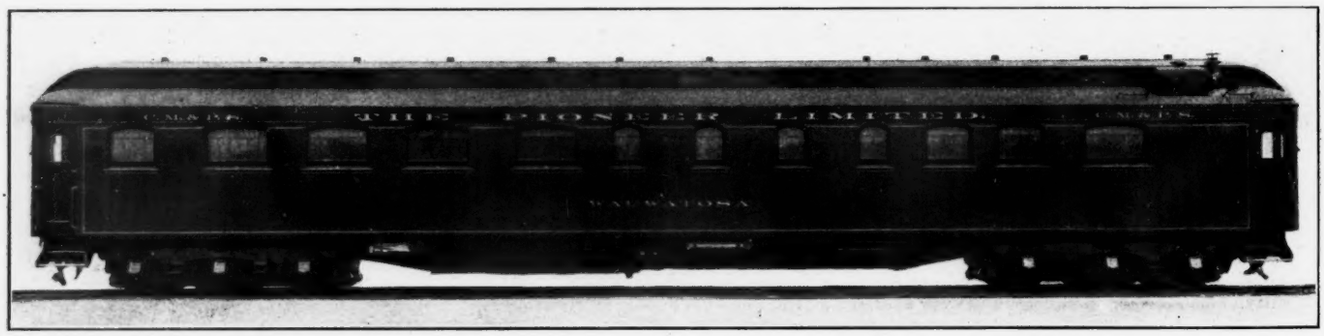
In addition to the 263 miles of the Sonora Railway in Mexico, which is leased by the Southern Pacific, the Southern Pacific Railroad of Mexico is building 830 miles of line south from the Sonora terminus at Empalme Junction, parallel to the Pacific coast, to Orendain, near Guadalajara, where it will connect with the Mexican Central. The latter road has a line southeast into the state of Oaxaca, with terminals not far from those of the Pan-American line bought recently by David E. Thompson, United States Ambassador to Mexico. Officials of the Southern Pacific deny, however, that the Harriman interests are concerned in that purchase, and say that they have no plans at present for providing an all rail line between the United States and the Canal zone. About two hundred miles of the above 830 are still to be built, as well as 100 miles of branch line running northward from Corral to extensive coal deposits in the vicinity of Tonichi. Another branch is under way between Naco, at the international

boundary on the Southern Pacific of Mexico line, northward to Gleeson, Arizona, 42 miles.

The amount of money involved in this construction, placed conservatively at $100,000,000, is an unparalleled outlay for the construction of branches and improvements in the case of a system already so well intrenched. Of the above amount about one half has already been expended, while the recent sales of treasury securities, together with the surplus accumulated from operation during the past year, gave the Union Pacific further working capital in the neighborhood of $55,000,000. The cost of much of the above construction will not have to be met for another year, or even two, so that the Harriman lines are able to carry on their improvement program without the necessity of making further provision for funds.

NEW PASSENGER EQUIPMENT FOR THE ST. PAUL.

The Barney & Smith Car Company recently delivered to the Chicago, Milwaukee & St. Paul Railway some very handsome passenger cars for use on the Pioneer Limited, which embody a number of interesting features. This equipment consists of 10 baggage, mail and express cars, 15 day coaches and 2 buffet library cars. All these cars have steel frames and steel underframes. They are modern and up to date in every particular and the interior



Elevation of New Library Car for the Pioneer Limited.

design and decorations are strikingly fine and original. In structural features, the three classes of cars are substantially the same, so that the description of the buffet library car given below will give a good general idea of the whole lot.

These buffet library cars are 72 ft. 6 in. long over end sills, 10 ft. wide over the frame, and are built with complete self-supporting steel underframes and steel frame work for the superstructure. The underframes are composed of built-up girder center sills and built-up side trusses in connection with the Commonwealth Steel Company's combined cast steel double body bolsters and platforms. The center construction consists of two $\frac{5}{16}$-in. web plates 30 in. deep at the central portion between the cross ties, tapering to 12 in. at the point of juncture with the bolsters, with four 3½-in. x 3½-in. x $\frac{5}{8}$-in. angles at the bottom of the webs, two 3½-in. x 3½-in. x $\frac{3}{8}$-in. angles at the top and one 24-in. x $\frac{3}{8}$-in. top cover plate. The side trusses consist of 24-in. x $\frac{5}{16}$-in. web plates with one 3-in. x 4-in. x $\frac{5}{8}$-in. angle at the top, one 3-in. x 4-in. x $\frac{3}{8}$-in. and one 3-in. x 3-in. x $\frac{5}{16}$-in. angle at the bottom. The top angle is placed on the inside of the web plate forming a foot rest. The $\frac{5}{16}$-in. angle is placed outside of the web plate and carries the wood railing strip to which the side sheathing is secured. The center construction is designed to resist the pulling and buffing shocks and to carry a proportion of the load, while the side trusses take care of the balance of the load.

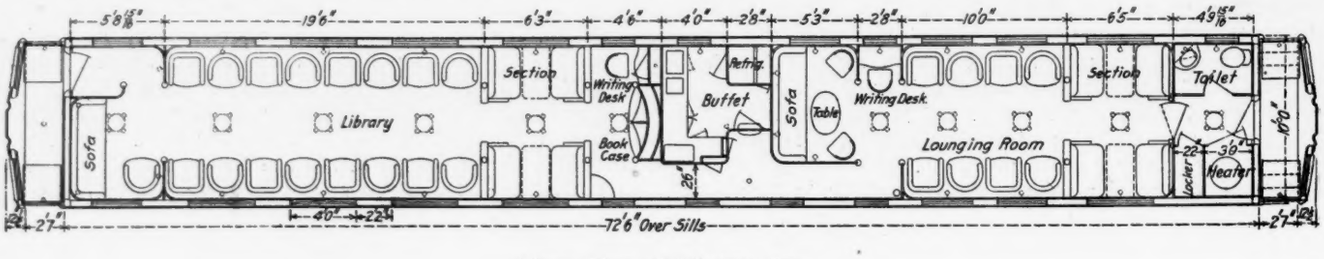
There are four Commonwealth Steel Co.'s cast steel cross ties and center filler castings per car, all 30 in. deep, the object being to equalize and distribute the load between the center construction and the side trusses. The floor supports between the cross ties are 4-in. channels.

The end framing and anti-telescoping device is composed of eight 4-in. "Z" bars at each end of the car, the lower ends extending down into pockets cast in the steel platform and riveted to the end sill sections. The upper end of each of these "Z" bars has the web cut out and the inner flange pressed back even with the outer flange, and both flanges are riveted to a pressed steel end plate, which in turn is securely connected to the side plates and roof framing of the car.

The side framing consists of $\frac{3}{16}$-in. pressed steel channel-shaped posts running from the side plates to the bottom of the side trusses. Each of these posts extends the full depth of the side truss and has a larger inner flange at this point, which provides an extremely large surface for securely riveting the post in position.

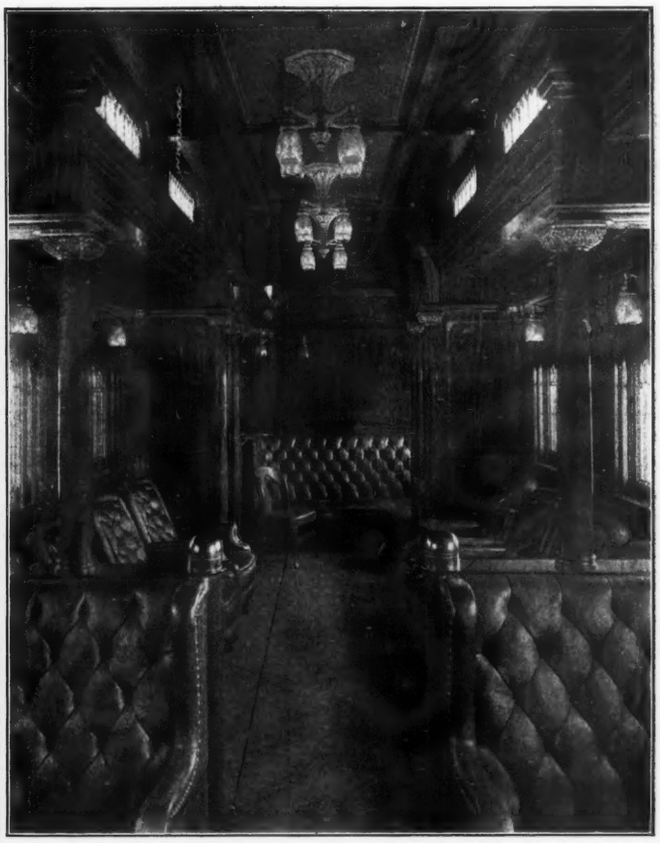
The side girths are composed of 3-in. x 3-in. x $\frac{5}{16}$-in. angles fitted and riveted between the pressed steel posts. The side plates, which are continuous, are of 3-in. x 3-in. x $\frac{3}{8}$-in. angles. The deck sills are continuous steel angles 4-in. x 4-in. x $\frac{5}{16}$-in. The deck plates are of $\frac{5}{16}$-in. pressed steel channel-shaped sections. The rafters, for both the upper and lower decks, are of angle section 2-in. x 1⅛-in. x $\frac{3}{16}$-in., bent to shape and riveted directly to the deck sills and the deck plates, and secured to the side plates by malleable iron castings riveted to the lower deck rafter and the side plates.

Nailing strips are bolted to the side posts and the rafters for securing the outside sheathing, the roof, the inside finish and the headlining. Wood nailing strips are placed in the bottom framing for securing the flooring, there being one deafening floor below the sills and the two upper floors. The finished floor is of "Flexolith" Composition Material, manufactured by the General Railway Supply Company. This composition is laid over expanded metal, which is attached to the upper course of wood flooring. The lower floors are further



Floor Plan of Library Car.

Interior of Library End, Showing Sofa.



Interior of Lounging End.

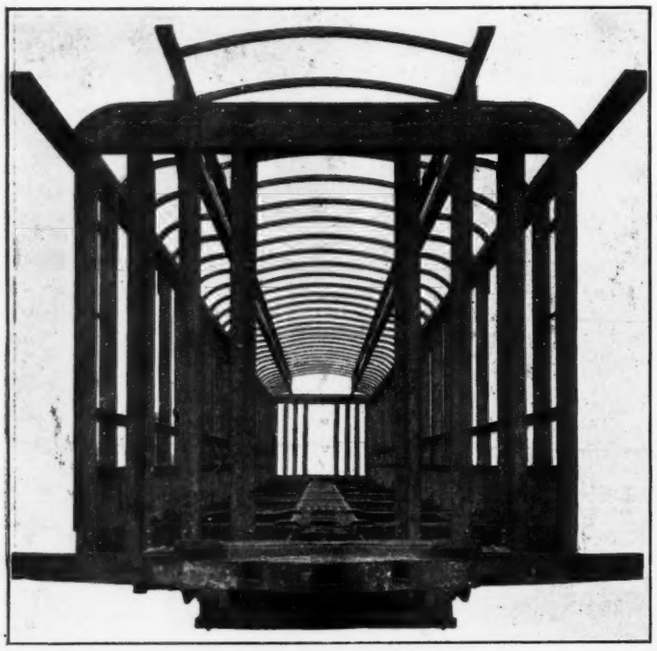
Interior of Lounging End, Showing Stationary Seat Section.

Library End, Looking Toward Book Case.

insulated with a course of 1½-in. hair felt placed between the floor nailing strips.

The draft and buffer attachments are extremely heavy, Miner Friction Draft Rigging and Forsyth Friction Buffers being used. The trucks used under the buffet library cars are the Commonwealth cast steel six wheel truck frame, equipped with Paige 38-in. wheels, Franklin journal box and Diamond special brake beams.

The controlling factor in the floor plan is the fact that in-



Exterior End of Steel Frame.

stead of being placed at the forward end of the train, as is usual with buffet library cars, this car is to be placed in the middle of the train or between sleeping cars so that sleeping car passengers may enter it from either end. This is likely to prove to be a most convenient and popular arrangement for passengers who want to use the car for reading or lounging.

The car is divided into two rooms with the buffet between them. The smaller of the two rooms is the lounging room; the larger is the library or reading room. The former is finished in dark woods with subdued lighting and color effects; the latter in lighter tones with brilliant coloring.

The interior finish of the lounging room is done in a dark wood, native to Peru, where it is known as "Quitacalcon." The builders who have used the wood for several years have given it the name of "Peruvian Mahogany." It is finely figured and takes a perfect polish. The interior finish of the library end is in Cuban mahogany, exquisitely marked. Delicately executed designs in marquetry of rare woods characterize the whole of the interior. All of the marquetry has had the special Barney & Smith treatment to preserve the natural colors of the woods. This treatment consists in carefully coating the marquetry after it is placed in position with a composition which is removed after the ground work has been filled. This treatment gives a clean-cut contrast and naturalness to the marquetry that is lacking in much of this sort of decoration to be found in passenger car ornamentation.

One of the noticeable features of the interior is the entire absence of square or angular corners in the library room. The bulkheads, side walls and partitions have round corners, forming a continuity of line which gives a pleasing relief from the usual box effect and thereby contributes to the general air of comfort and repose, which is the characteristic idea throughout.

The idea of the curved lines is carried into both the lower and upper decks in the library room. The general effect of roominess is much enhanced by the height of the windows. All of the windows stop at the chair rail line and the result is an impression of bulk and strength on the exterior and altitude and space on the interior.

The electroliers are specially designed to suit the general theme and are finished in statuary bronze. Those in the lounging room have iridescent shades while those in the library end have Holophane shades.

The inside windows are of leaded glass with a combination of polished French plate combined in designs of richly colored cathedral glass. The glass in the deck sash is of the same general character.

In the lounging room, the ceiling is finished in canvas and is paneled with massive beams and painted a rich red slightly relieved with gold line ornamentation.

The carpets are of the best Wilton. The chairs, sofas and

Interior of Steel Frame.

cozy corners are upholstered in Spanish leather in shades to match the color schemes of the rooms in which they are placed.

According to a consular report, the traffic receipts for the fiscal year ended June 30, 1909, of all railways in Argentina increased by $6,618,440 (gold), or 8 per cent.; the approximate increases for the leading lines are: Buenos Aires and Pacific, $2,311,587; General Buenos Aires Province, $1,459,950; Great Southern, $997,632; Western, $330,922; Entre Rios, $326,055; Santa Fé Provincial, $272,524; Cordoba & Rosario, $170,327; Northeast Argentine, $155,728; Central Cordoba, Central Northern and Northwest Sections, $145,995; Central Northern, $126,529; Buenos Aires Central, $97,330; Central Cordoba, $87,597; Central Argentine, $78,997; North Argentine, $58,398; National Andina, $4,866. The rapidly developing southern and western portions of Argentina show a most marked increase in the traffic receipts.

General News Section.

The Pennsylvania Railroad reports that of the 46,907 passenger trains operated by it in the month of August, 42,676, or 90.9 per cent., made schedule time.

P. H. Morrissey, president of the Railroad and Employees Investors' Association, announces that during the year since this association was organized 125 local chapters have been established and that the membership is now over 25,000.

The Chicago, Rock Island & Pacific has added its name to the list of western railways which announce that they operated during the year ended June 30, 1909, without killing a passenger. The total number of passengers transported during the year was 18,743,022.

The Chicago & North Western has issued a folder containing the record, reprinted from the *Minneapolis Journal*, of a special train which was run from St. Paul to Chicago, on August 17, in 7 hours, 24 minutes, including stops, the distance being 400 miles. This makes the rate 54.05 miles an hour. From St. Paul to Elroy, 194.1 miles, the time was 3 hours, 17 minutes, or 59 miles an hour.

The Great Northern, on September 27, put on a fast mail train, running from St. Paul to Seattle in 48 hours, which is about 11 hours less than the best time heretofore made. It will make it possible to deliver mail from the East to Puget Sound cities 24 hours earlier than heretofore. The new train leaves St. Paul at 8 a.m., Central time, and reaches Seattle at 6 a.m., Pacific time, on the third day. The distance is 1,814 miles, making the rate of speed 37.7 miles an hour.

George H. Ingalls, freight traffic manager of the New York Central lines west, took 200 freight agents of these lines last week on a two days' trip over the various belt lines in and around the Chicago district belonging to the New York Central system. They traveled in a special train, staying all night at South Bend, Ind., where they were given a dinner. The object of the trip was to thoroughly familiarize those in the party with the system's freight connections and facilities and to get them better acquainted with each other.

About November 1 the Oregon Short Line will begin using a stereopticon in giving instruction to its employees in the rules of operation. A photographer has taken pictures of 55 views along the line, most of them being of block signals in different positions, which will be reproduced. It has long been the practice of the Oregon Short Line to have instructions given to employees by a conductor, a locomotive engineer and a chief train despatcher. These three, being first instructed specially by the operating officers so that they will be prepared to give uniform interpretations of rules, are then sent over the line to instruct their fellow employees. This will be the first time that a stereopticon has been used on this road in this work.

Proposed Ordinance Requiring Electrification of All Railways in Chicago.

Alderman Bernard W. Snow, one of the leaders of the Chicago City Council, introduced an ordinance in the council on September 27 requiring that after January 1, 1912, every railway "shall operate and propel any and all cars or trains within a radius of eight miles of the city hall in the city of Chicago by electrical power." The proposed ordinance further provides that every railway now operating or propelling cars or trains in Chicago, or now authorized by ordinance to do so, shall within one year after the enactment of the ordinance submit to the commissioner of public works of the city plans for the electrification of its terminals, and after its plans have been approved by the commissioner the railway shall proceed within six months with the work of electrification. The proposed ordinance also provides that no road shall propel any train or car within a radius of 8 miles of the city hall by any means other than electricity at any time after one year from the passage of the ordinance, unless at the time of so doing it shall have submitted plans and specifications for electrification to the commissioner of public works.

The newspapers of Chicago have contained various reports during the past week regarding the electrification plans of the Illinois Central. The facts are that officers of the Illinois Central have been working on plans for electrification of its suburban tracks and have made tentative estimates from time to time which have been submitted to the city. These estimates indicate that electrification will involve such a large outlay as to increase the expense of operation and the interest charges so greatly that it will be found inexpedient to electrify. It is reported that this will be the substance of the report of President Harahan to the directors. The newspaper statements that the report of Mr. Harahan will be unfavorable to electrification are no doubt mainly responsible for the introduction of the ordinance requiring all the railways within the city to electrify their terminals.

Motor Cars on the Oregon Short Line.

The Oregon Short Line has established motor car service between Ogden (Utah) and Malad. The car, which is a McKeen, leaves Ogden daily at 8:45 a.m. and arrives at Malad at 12:10 p.m., 73 miles. On the return trip it leaves Malad at 2:20 p.m. and arrives at Ogden at 5:45 p.m. It makes 22 stops each way. The service is at present regarded as experimental.

National Association of Railway Commissioners.

This association will hold its annual meeting at Washington, D. C., beginning Tuesday, November 16. The secretary is William H. Connolly, Washington.

American Association of Railway Superintendents.

The Central Association of Railroad Officers, which has just closed its twenty-third annual convention at Cincinnati, has adopted a new constitution and changed the name of the association to that which appears as the title of this paragraph. The next meeting will be held in Chicago in March, 1910. The meeting which has just closed chose as president J. A. Somerville (M. P.), Kansas City; first vice-president, Brent Arnold (L. & N.), Cincinnati; second vice-president, S. M. Russell (T. P. & W.), Peoria; secretary, O. G. Fetter, Cincinnati.

Union Pacific Officers' Meeting.

The annual meeting of operating and traffic officers of the Union Pacific was held in Omaha on September 25. Among the subjects on which committees made reports were the following: "Block Signals," "Making and Filling of Requisitions for Material and Supplies," "Agents and Trainmen," "Regularity vs. Speed in Movement of Freight," "Division Accounting," "Per Diem Regulations—Proper Handling of Equipment to Secure Results," "Annual Inspection—Federal Requirements," "Telephone Despatching of Trains." D. C. Buell, chief of the Educational Bureau of Information, read a paper regarding this bureau and its work.

Railway Signal Association.

Secretary C. C. Rosenberg has issued the notice of the annual meeting, which is to be held at Louisville, Ky., October 12, 13 and 14. The reports of the committees are scheduled for discussion as follows: Tuesday, committees Nos. 2, 3, 6 and 7, and the special committee on storage batteries. Wednesday, committees No. 1 and No. 4; Thursday, committee No. 5, committee on wires and cables, committee on lightning arresters. Two amendments to the constitution have been proposed; one to change Article 9, Section 1, so as to have a meeting at New York in June, instead of May, and the other

to change Article 6 so as to make the association subordinate to the American Railway Association as regards all of its findings, conclusions, specifications and standards. Under new Section 5, the executive committee is to report such matters to the A. R. A. with request for approval if "consistent." Under Section 6 the executive committee is to print a manual of recommended practice after such recommendations have been approved by the A. R. A.

Association of Car Lighting Engineers.

The annual meeting will be held in Chicago, October 4 to 7, at the new LaSalle hotel. In addition to the papers to be presented, the question of changing the scope of the association will be brought up at this meeting. It is thought advisable to change the name to Association of Railway Electrical Engineers as most of the electrical engineers and chief electricians of railways have to do with general railway electrical work and are not confined to car lighting work.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

Air Brake Association.—F. M. Nellis, 53 State St., Boston, Mass.
American Association of Demurrage Officers.—A. G. Thomason, Scranton, Pa. June, 1910; Niagara Falls, Ont.
American Assoc. of Local Freight Agents' Ass'ns.—G. W. Dennison, Penna. Co., Toledo, Ohio.
American Institute of Electrical Engineers.—R. W. Pope, 33 West 39th St., New York; second Friday in month: New York.
American Railway Association.—W. F. Allen, 24 Park Place, New York. Nov. 17: Chicago.
American Railway Bridge and Building Association.—S. F. Patterson, B. & M., Concord, N. H.; Oct. 19, 1909: Jacksonville, Fla.
American Railway Engineering and Maint. of Way Assoc.—E. H. Fritch, Monadnock Bldg., Chicago. March 14-17, 1910: Chicago.
American Railway Industrial Association.—G. L. Stewart, St. L. S. W. Ry., St. Louis; second Tuesday, May; Memphis, Tenn.
American Railway Master Mechanics' Association.—J. W. Taylor, Old Colony Bldg., Chicago.
American Society for Testing Materials.—Prof. Edgar Marburg, Univ. of Pa., Philadelphia.
American Society of Civil Engineers.—C. W. Hunt, 220 W. 57th St., N. Y.; 1st and 3d Wed., except July and August; New York.
American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., N. Y.; 2d Tues. in month; annual, Dec. 7-10; New York.
American Street and Interurban Railway Association.—B. V. Swenson, 29 W. 39th St., New York; Oct. 4-8; Denver, Colo.
Association of American Railway Accounting Officers.—C. G. Phillips, 143 Dearborn St., Chicago. June 29, 1910; Colorado Springs.
Association of Railway Claim Agents.—E. H. Hemus, A., T. & S. F., Topeka, Kan.; May; Nashville, Tenn.
Association of Railway Telegraph Superintendents.—P. W. Drew, Wisconsin Central Ry., Chicago. May 16-20, 1910; Los Angeles.
Association of Transportation and Car Accounting Officers.—G. P. Conard, 24 Park Place, N. Y. Dec. 14-15; Chattanooga.
Canadian Railway Club.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.
Canadian Society of Civil Engineers.—Clement H. McLeod, Montreal, Que.; irregular, usually weekly; Montreal.
Central Railway Club.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.
Freight Claim Association.—Warren P. Taylor, Rich., Fred. & Pot. R. R., Richmond, Va. June 15, 1910, California.
International Master Boiler Makers' Association.—Harry D. Vought, 95 Liberty St., New York.
International Railway Fuel Association.—D. B. Sebastian, La Salle St. Station, Chicago.
International Railway General Foremen's Association.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.; May; Cincinnati.
Iowa Railway Club.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month; except July and August; Des Moines
Master Car Builders' Association.—J. W. Taylor, Old Colony Bldg., Chicago.
New England Railroad Club.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tues. in month, ex. June, July, Aug. and Sept.; Boston.
New York Railroad Club.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.
North-West Railway Club.—T. W. Flanagan, Soo Line, Minn.; 1st Tues. after 2d Mon., ex. June, July, August; St. Paul and Minn.
Railway Club of Pittsburgh.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month; except June, July and August; Pittsburgh.
Railway Signal Association.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.; Oct. 12-14; Louisville, Ky.
Railway Storekeepers' Association.—J. P. Murphy, Box C, Collinwood, Ohio.
Roadmasters' and Maintenance of Way Association.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.
St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.
Society of Railway Financial Officers.—C. Norquist, Chicago.
Southern Association of Car Service Officers.—J. H. O'Donnell, Bogalusa, La.; Oct. 21; Birmingham, Ala.
Southern and Southwestern Ry. Club.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., April, Aug. and Nov.; Atlanta.
Traveling Engineers' Association.—W. O. Thompson, N. Y. C. & H. R. R. R., East Buffalo, N. Y.
Western Canada Railway Club.—W. H. Rosevear, 199 Chestnut St., Winnipeg; 2d Mon., ex. June, July and Aug.; Winnipeg.
Western Railway Club.—J. W. Taylor, Old Colony Bldg., Chicago; 3d Tuesday each month, except June, July and August; Chicago.
Western Society of Engineers.—J. H. Warder, Monadnock Bldg., Chicago; 1st Wednesday, except July and August; Chicago.

Traffic News.

The new club rooms of the Traffic Club of Chicago, on the eighteenth floor of the La Salle Hotel, were opened for occupancy on Tuesday, September 28. After the formal opening of the rooms the first luncheon was served in them.

The executive committee of the Western Passenger Association has extended the time during which reduced rates for homeseekers will apply to include the months of November and December, instead of withdrawing them at the end of October. The question of reducing the number of points at which stopover privilege is granted was considered, but no action was taken.

At Philadelphia last week the Pennsylvania Railroad caused the arrest of a passenger charged with using a season ticket which had been issued in the name of another person. Officers of the railway say that misuse of non-transferable commutation tickets has been common of late, and the man arrested, who belongs in New Brunswick, N. J., was held in $500 bail by the United States commissioner, the ticket being for interstate journeys.

To encourage the promoters who have been trying to secure grain from western Canada for the steamships on the Pacific ocean, the Canadian Pacific has provided facilities at Vancouver for putting grain in sacks, but an officer of the road says that no grain is offered. From Calgary to Liverpool, via the Pacific ocean, no rate has been made less than 34.45 cents, whereas by way of Fort William and Atlantic ports the rate in summer is 24.40 cents.

A comparative statement of the number of cars handled by 35 car service associations and demurrage bureaus during July, 1909, and the seven months ending July 31, 1909, compiled by the Bureau of Statistics of the Department of Commerce and Labor, shows a substantial increase for 1909 over 1908 and a slight decrease under 1907. The figures for July are: 2,605,832 in 1909; 2,240,804 in 1908; and 2,728,938 in 1907. For the seven months, including July, the figures are: 17,521,719 for 1909; 14,840,385 for 1908; and 18,614,604 for 1907.

H. A. Fairchild, chairman of the Washington railway commission, stated in a recent newspaper interview that this commission within the near future will begin investigating the reasonableness of all railway rates between points within the state. He said that as a result of the valuation of railways made by the commission some months ago, it feels that it now has the information necessary to enable it to pass on the reasonableness of all the rates in the state. Its method of procedure will be to challenge the reasonableness of all state tariffs. It will make a comparison of rates on classes and commodities and between different localities and attempt to equalize and adjust them so as to leave the railways an adequate return for the valuation of their property, and where facts justify such action will make reductions in rates.

By the opening of the Jamestown, Franklin & Clearfield, which is an extension eastward of the Jamestown & Franklin division of the Lake Shore & Michigan Southern, the New York Central and the Reading will have a new through freight line between Philadelphia and Chicago, 180 miles shorter than the present route. The new line connects at its eastern terminus with the Pennsylvania division of the New York Central & Hudson River, which reaches Williamsport, Pa., the western terminus of the Philadelphia & Reading. At present freight for Philadelphia brought by the Lake Shore and other New York Central lines from the West is taken to Lyons, N. Y., and then southward to Williamsport over the north and south line of the Pennsylvania division of the New York Central. By this route the distance between Philadelphia and Chicago is 1,025 miles. By the new route now opened it is 845 miles. The distance between these two cities over the Pennsylvania is about 818 miles, while by the Philadelphia & Reading, the Lehigh Valley and Grand Trunk the distance is 953 miles.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF JULY, 1909.
(See also issues of September 17 and 24, 1909.)

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenues (or deficit).	Outside operations. net.	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with last year.
		Freight.	Passenger.	Total, inc. misc.	Maintenance Way and structures.	Maintenance Of equipment.	Traffic.	Transportation.	General.	Total.					
Arizona & New Mexico	108	$66,875	$6,501	$76,050	$7,001	$3,918	$39	$10,553	$1,330	$22,841	$53,209	.....	$875	$52,334	—$1,025
Atlantic & St. Lawrence	167	50,441	32,036	92,013	23,986	12,524	2,769	27,173	4,297	70,749	21,264	.....	6,435	14,829	—2,802
Beaumont, Sour Lake & Western	117	33,381	2,996	37,357	7,389	2,120	1,339	11,137	2,103	24,088	13,269	.....	454	12,815	10,993
Belt Ry. Co. of Chicago	21	24,472	18,122	178,174	11,872	22,822	636	61,084	5,600	102,014	76,160	.....	5,000	71,160	21,670
Chicago, Detroit, & Canada G. T. Jct.	60	.....	.....	50,783	11,574	8,774	2,420	28,114	2,355	53,237	—2,454	.....	2,318	—4,772	—2,469
Coal & Coke	191	40,844	15,022	58,433	9,593	16,224	1,136	15,238	2,209	44,400	14,033	$5,860	3,500	16,393	1,856
Colorado & Wyoming	55	28,615	4,142	65,265	8,727	10,930	417	16,424	1,392	37,890	27,375	.....	1,000	26,375	15,980
Colorado Spgs, & Cripple Creek Dist.	74	42,254	23,041	66,910	6,250	6,039	1,524	20,488	2,597	36,898	30,012	.....	1,900	28,112	2,755
Columbia & Puget Sound	58	43,546	6,709	56,327	5,178	8,203	181	11,328	804	25,694	30,633	.....	1,847	28,786	5,902
Cumberland & Pennsylvania	32	61,240	1,614	64,283	5,733	20,470	306	17,595	2,560	46,664	17,619	24	2,800	14,843	—9,708
Denver, Northwestern & Pacific	214*	34,820	64,842	102,916	18,328	8,498	4,406	20,367	3,556	55,155	47,761	.....	2,500	45,261	4,487
Detroit & Toledo Short Line	79	69,345	.....	69,489	14,721	4,627	1,294	18,625	1,664	40,931	28,558	.....	3,050	25,508	7,617
Detroit, Grand Haven & Milwaukee	191	89,169	59,417	168,742	27,350	19,016	5,989	62,125	19,112	133,592	35,150	78	2,727	32,501	790
Duluth, Rainy Lake & Winnipeg	93	30,864	8,043	40,009	4,925	5,468	247	14,065	1,319	26,024	13,985	.....	1,603	12,382	9,057
Eastern Ry. Co. of New Mexico	227	54,136	37,981	97,088	16,662	16,394	979	26,499	2,630	63,164	33,924	.....	3,480	30,444	—9,692
Florence & Cripple Creek	55	25,474	14,710	41,230	4,076	3,910	990	13,317	1,553	23,846	17,384	.....	1,235	16,149	1,080
Fonda, Johnstown & Gloversville	84	19,346	62,636	85,206	6,137	3,423	1,593	19,910	4,628	35,691	49,515	1,738	3,000	48,253	5,542
Fort Smith & Western	221	32,336	19,222	54,699	17,094	15,153	1,071	16,658	2,459	52,435	2,264	.....	4,200	—1,936	5,573
Fort Worth & Rio Grande	196	25,607	26,886	57,684	10,638	8,436	3,670	27,037	3,915	53,696	3,988	.....	1,728	2,260	4,481
Georgia & Florida	254	20,412	12,172	34,269	5,026	5,372	1,251	12,025	3,894	27,568	6,701	.....	1,360	5,341	2,616
Georgia, Florida & Alabama	167	15,419	14,289	32,659	5,008	4,713	975	13,813	4,378	28,887	3,772	—347	1,560	1,865	—1,515
Gila Valley, Globe & Northern	125	65,665	13,610	83,933	29,731	6,561	1,312	19,792	2,354	59,750	24,183	.....	1,900	22,283	—9,049
Grand Trunk Western	336	270,835	181,453	481,875	49,439	66,371	27,160	167,719	23,797	334,486	147,389	7	29,190	118,206	65,314
Green Bay & Western	225	20,552	17,107	41,289	9,713	6,665	531	13,680	1,482	32,071	9,218	.....	1,710	7,508	—2,290
Huntingdon & Broad Top Mountain	70	41,925	9,239	53,306	6,129	6,194	240	14,609	3,500	30,672	22,634	.....	2,000	20,634	—766
Idaho & Washington Northern	63	38,315	10,798	50,083	2,932	5,256	1,308	16,345	751	26,592	23,491	.....	498	22,993	13,345
Illinois Southern	136	25,591	4,691	31,972	6,851	4,895	808	12,827	2,665	28,046	3,926	.....	1,512	2,414	3,251
Indiana Harbor Belt	105	.....	.....	146,854	26,027	20,272	1,744	70,467	4,426	122,936	23,918	—2,231	3,200	18,487	6,751
International Ry. of Maine	233	26,956	16,366	50,733	26,469	8,628	4,328	24,861	3,040	67,326	—16,593	.....	5,000	—21,593	—29,736
Kansas City, Clinton & Springfield	154	15,198	11,522	29,288	6,231	2,509	536	9,955	1,794	21,025	8,263	.....	2,000	6,263	—2,043
Lackawanna & Wyoming Valley	23	4,954	47,924	53,990	3,331	7,104	611	16,627	1,313	28,986	25,004	—244	1,870	22,890	—406
Lake Erie, Alliance & Wheeling	88	37,857	3,851	42,866	23,330	6,414	895	14,387	700	45,726	—2,860	.....	2,000	—4,860	4,168
Lake Terminal	12†	.....	.....	57,087	7,632	6,826	.....	16,058	75	30,591	26,496	.....	971	25,525	21,631
Manistee & North Eastern	129	31,542	9,016	42,363	8,039	6,138	692	12,669	1,924	29,462	12,901	.....	2,364	10,537	1,427
McCloud River	76	59,239	2,536	62,383	6,294	5,251	3	10,105	2,216	23,869	38,514	.....	221	38,293	18,847
Mineral Range	126	66,555	4,421	73,665	15,466	11,060	811	32,426	3,087	62,850	10,815	.....	3,200	7,615	—2,313
Minnesota & International	177	28,502	17,683	51,210	8,896	6,940	377	15,543	1,945	33,702	17,508	.....	2,049	15,459	5,081
Mississippi Central	164	35,418	16,222	54,156	8,117	10,071	1,055	15,279	4,120	38,642	15,514	.....	1,200	14,314	3,683
Mississippi River & Bonne Terre	53	44,612	10,318	60,914	7,664	8,049	966	20,770	3,476	40,925	19,989	.....	923	19,066	—4,003
Missouri & North Arkansas	365‡	30,840	21,309	55,688	13,357	6,081	1,894	17,555	1,985	40,872	14,816	.....	5,000	9,816	9,150
Monongahela	61	96,792	2,128	100,880	13,183	5,027	270	19,467	1,561	39,508	61,372	.....	1,200	60,172	30,392
Monongahela Connecting	7	72,473	.....	82,429	13,934	10,708	315	32,176	2,515	59,648	22,781	.....	1,455	21,326	25,929
Montana	155	25,935	10,957	35,117	4,538	2,382	780	8,366	1,822	17,888	17,229	.....	1,795	15,434	—23,225
Nevada-California-Oregon	184	28,004	12,988	43,828	5,025	3,950	556	6,720	1,798	18,049	25,779	.....	1,161	24,618	8,984
New Jersey & New York	48	13,690	49,485	65,958	8,482	3,359	1,119	22,923	767	36,650	29,308	.....	500	28,808	7,002
Newburgh & South Shore	12	.....	442	43,790	4,519	12,784	.....	14,753	1,586	33,642	10,148	.....	1,138	9,010	15,692
Pecos & Northern Texas	151	100,657	27,085	132,631	15,298	19,566	1,517	34,618	4,202	75,201	57,430	.....	1,198	56,232	13,404
Peoria & Pekin Union	18	3,707	1,799	64,167	8,769	6,502	.....	25,571	3,241	44,083	20,084	.....	3,500	16,584	7,978
Port Reading	21	62,838	.....	63,321	8,290	131	27	16,967	279	25,694	37,627	95	3,000	34,722	—24,455
Quincy, Omaha & Kansas City	262	41,981	17,740	64,718	29,976	11,444	1,424	26,405	2,856	72,105	—7,387	.....	2,450	—9,837	—6,365
Richmond, Fredericksburg & Potomac	83	115,592	48,082	184,727	31,238	21,542	2,444	54,304	5,084	114,612	70,115	.....	200	69,915	—539
Rio Grande	180	29,797	11,941	45,122	11,849	3,890	167	14,088	2,270	32,264	12,858	.....	2,500	10,358	—10,609
St. Lawrence & Adirondack	65	28,555	25,044	54,762	5,797	9,335	381	31,477	765	47,755	7,007	.....	386	6,621	—16,505
St. Louis Merchants' Bridge Terminal	9	.....	3,792	116,624	24,995	3,208	384	46,278	4,171	79,036	37,588	.....	4,300	33,288	10,605
St. Louis, San Francisco & Texas	135	48,952	9,468	61,854	8,846	10,293	2,643	29,611	2,858	54,251	7,603	.....	703	6,900	4,089
St. Louis Transfer	6	.....	.....	19,074	3,269	942	152	8,619	1,614	14,596	4,478	.....	933	3,545	—5,192
St. Paul & Des Moines	121§	27,358	14,289	40,872	5,597	3,375	2,523	16,448	1,026	28,969	11,903	.....	1,000	10,903	6,896
Sierra Ry. Co. of California	76	26,927	12,334	41,199	3,852	3,854	260	7,592	1,619	17,177	24,022	.....	1,500	22,522	4,017
South Buffalo	35	30,237	1,206	64,256	1,985	5,617	241	24,626	1,238	33,707	30,549	.....	800	29,749	26,829
Southern Kansas Ry. of Texas	125	104,799	20,640	128,841	19,209	22,938	1,791	40,010	3,371	87,319	41,522	.....	1,551	39,971	28,518
Southern Ry. of Mississippi	280‖	28,429	21,083	54,654	17,990	4,501	1,981	29,688	2,523	56,683	—2,029	.....	4,502	—6,531	.....
Staten Island	13	1,437	22,660	25,069	2,273	3,002	631	10,045	1,371	17,322	7,747	3,980	1,200	10,527	4,977
Staten Island Rapid Transit	11	35,921	27,140	64,880	8,047	6,586	871	20,983	3,402	39,889	24,991	18,696	3,000	40,687	19,065
Terminal R.R. Assn of St. Louis	26	.....	230	213,631	36,964	12,611	539	61,365	4,108	115,587	98,044	14,403	21,000	91,447	15,631
Tonopah & Goldfield	109	42,361	15,014	61,166	6,308	5,995	2,269	21,943	4,055	40,569	20,596	.....	2,992	17,604	6,408
Tonopah & Tidewater	181	28,743	7,260	38,405	4,698	2,661	2,777	11,309	1,223	22,668	15,737	.....	2,000	13,737	9,884
Union of Pittsburgh	31	.....	.....	409,204	28,126	47,999	100	94,641	2,031	172,897	236,307	1,600	500	237,407	112,615
Wabash-Pittsburgh Terminal	63	53,296	8,597	64,229	5,695	9,438	2,131	20,925	3,680	41,869	22,360	.....	5,700	16,660	—25,180
Washington County	139	23,120	20,317	46,645	9,024	3,605	349	13,483	798	27,259	19,386	.....	229	19,157	10,588
Washington Southern	35	40,431	25,047	86,159	7,127	7,406	1,131	27,686	2,219	45,569	40,590	.....	2,345	38,245	5,590
Western Maryland	543	415,758	104,615	545,057	70,708	72,494	11,706	156,359	12,452	323,719	221,338	.....	17,500	203,838	27,028
Wichita Valley	174	28,082	19,553	49,973	8,561	2,724	271	17,168	1,673	30,397	19,576	.....	1,778	17,798	—4,143
Wyoming & North Western	148	33,602	9,445	44,268	3,796	1,646	354	10,395	327	16,518	27,750	.....	2,100	25,650	18,677
Yosemite Valley	79	7,001	36,472	44,414	3,030	1,554	1,297	4,569	991	11,441	32,973	.....	1,000	31,973	10,100

*Mileage operated July 31, 1908, 162.
†Mileage operated July 31, 1908, 6.
‡Mileage operated July 31, 1908, 201.
§ Mileage operated July 31, 1908, 70.
‖ Not independently operated in July, 1908.
— Indicates Deficits, Losses and Decreases.

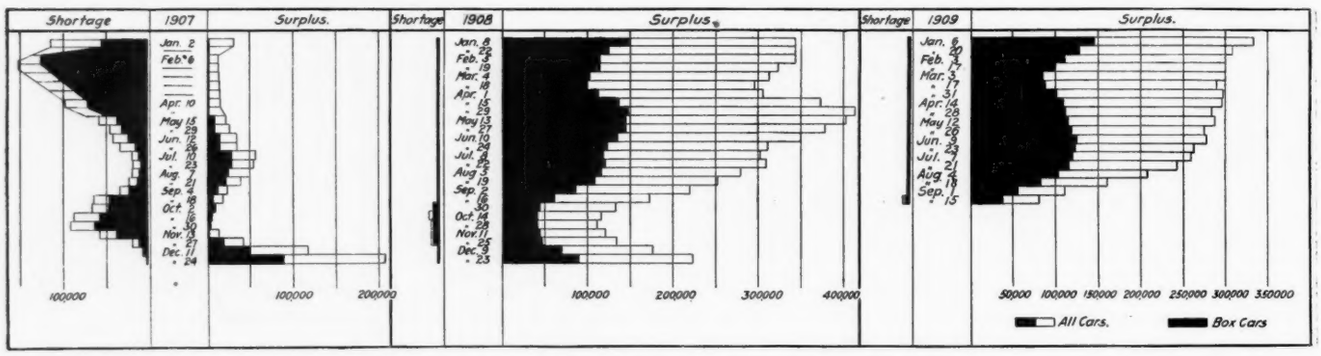
Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 55-A, giving a summary of shortages and surpluses by groups from May 27, 1908, to September 15, 1909, says:

"There is a decrease of 31,778 cars, bringing the total surplus down to 78,798. The decrease is general in all classes and through all sections of the country, although the greatest percentage of reduction is in the eastern territory. In groups 1 (New England) and 4 (North Atlantic) the surplus has practically disappeared, while in group 2 (Eastern) there are but 4,440 surplus cars of all classes, these being chiefly on the western districts of roads carried in group 2.

CAR SURPLUSES AND SHORTAGES, APRIL 27, 1908, TO SEPTEMBER 15, 1909, INCLUSIVE.

		Surpluses.					Shortages				
	Number of roads.	Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
September 15, 1909	177	38,342	4,767	16,255	19,434	78,798	3,294	423	3,346	362	7,425
September, 1, 1909	175	54,284	6,416	25,842	24,034	110,576	1,713	418	1,585	183	3,899
August 18, 1909	169	82,505	5,953	42,158	28,808	159,424	556	277	1,076	100	2,009
July 21, 1909	165	116,221	9,971	78,675	38,487	243,354	106	169	31	33	339
June 23, 1909	166	121,441	12,099	89,292	40,112	262,944	211	190	193	233	827
May 26, 1909	158	118,077	14,940	97,006	43,687	273,710	83	99	1,011	47	1,240
April 28, 1909	161	107,665	16,487	110,538	47,638	282,328	144	106	74	173	497
March 31, 1909	158	101,344	20,428	128,546	46,282	296,600	158	98	116	27	399
February 17, 1909	159	98,512	23,924	135,208	43,797	301,441	266	97	11	96	470
January 20, 1909	162	127,204	26,723	116,680	41,057	311,664	163	21	139	35	358
December 23, 1908	158	87,350	16,247	79,595	38,885	222,077	471	42	289	217	1,019
November 25, 1908	160	45,194	12,157	43,854	31,624	132,829	7,923	178	900	209	9,210
October 28, 1908	158	39,383	10,185	31,541	29,803	110,912	8,175	167	2,261	236	10,839
September 30, 1908	160	42,593	10,365	49,795	31,039	133,792	7,313	450	224	127	8,114
August 19, 1908	160	106,367	13,494	92,500	40,642	253,003	465	90	105	194	854
July 22, 1908	166	120,580	14,401	125,739	47,960	308,680	115	37	330	27	509
June 24, 1908	163	123,112	18,042	130,149	41,995	313,298	266	34	120	31	451
April 27, 1908	160	144,697	20,075	162,695	54,437	381,904	82	13	12	18	125



Car Surpluses and Shortages in 1907, 1908 and 1909.

"The scattering shortages have increased to 7,425 cars, about evenly divided between coal and box."

The accompanying table shows the shortages and surpluses for the period covered by the report and the diagram shows shortages and surpluses for 1907, 1908 and 1909.

Pennsylvania Railroad Experimental Farm.

The Pennsylvania Railroad has bought a farm of 50 acres at Bacon, Del., on the Delaware Railroad, to operate as an experiment station for the benefit of the farmers of Maryland, Delaware and the Virginia Peninsula. President James McCrea last autumn made a trip through the peninsula and saw thousands of acres idle, with the adjoining farms flourishing. Knowing the success of the Long Island experimental farms, which have now been in operation four years, Mr. McCrea suggested the present experiment. According to the last census there are 3,916,800 acres of land on the peninsula, of which only about 2,058,299 acres are under cultivation. The co-operation of the farmers of the peninsula in this enterprise is already assured, and the state agricultural colleges and horticultural societies are enthusiastic supporters.

This peninsula is favorably situated. Fruit and vegetables are delivered in one day in Maryland and Pennsylvania, and fast freight trains are run to all points east of the Mississippi. The demand is greater than can now be met and the railway is taking steps to aid in increasing the number of farmers to supply it. H. S. Lippincott, a graduate of the Agricultural College at Cornell University, is superintendent of the farm. He will visit the granges and farmers' institutes on the peninsula and will be prepared to make addresses. He will make exhibits of some of the products raised on the farm.

When the Long Island Railroad established a demonstration farm many scoffed at the idea, claiming that it was impossible to grow anything on the waste land chosen for the experiment; but in two years the Long Island people had succeeded in growing successfully 380 different varieties of plants. The first Long Island farm was established as an experiment. Today two farms are in operation, and they are considered permanent institutions. These farms pay for the transportation of their material just as other farms do. They are there to show what can be done under normal conditions.

Improvements in Southern Pacific Passenger Service.

The Southern Pacific has been making material improvements in its passenger service between Pacific coast points for several months; and a daylight parlor car train is to be put on between San Francisco and Los Angeles which will make the run in 13½ hours. The fastest time now made is that of the "Owl" train, the schedule of which was shortened on August 8 from 15 hours and 55 minutes to 14 hours.

The "Shasta Limited," which has been running during the past summer, runs 772 miles without taking on or letting off a passenger; that is, from Portland to San Francisco. This beats the Twentieth Century Limited for exclusiveness; the Twentieth Century takes on passengers sometimes at Rochester, and lets off at Elkhart, which are only about 500 miles apart. Rochester and Redding, however, are not built on exactly the same plan. The fastest time formerly between Portland and San Francisco was 38 hours, but the time of the Shasta Limited is 27 hours, 18 minutes. The average speed maintained is still comparatively low, but the train has to climb very steep grades, which in the Siskiyou mountains reach a maximum of 174 ft. to the mile.

Hearing in Salt Lake Traffic Bureau Case.

Commissioners C. A. Prouty and E. E. Clark of the Interstate Commerce Commission took testimony at Salt Lake City, Utah, last week, beginning on September 22, on the complaint made by the Salt Lake City Traffic Bureau, regarding freight rates to Salt Lake City, both from the East and from the Pacific coast. This was the first of a series of hearings that will be held by the Commission at intermountain and Pacific coast cities, to see if a basis can be reached for the readjustment of rates in all the territory west of the Missouri river. The hearing at Salt Lake was attended by the traffic managers and some of the best legal talent of almost every railway west of the Missouri river.

The complaint of the Salt Lake Traffic Bureau alleges in brief that all through railway rates to Salt Lake are discriminatory against that city and unreasonable in themselves, and asks that they shall be reduced to a mileage basis. The complainants do not ask merely the same rates as are made to the Pacific coast cities on westbound traffic, but ask that the rates from the East to Salt Lake City shall be made only 66 per cent. of the rates to the Pacific coast terminals.

The first witnesses called for the Salt Lake Traffic Bureau were B. F. Baeur, of the Salt Lake Hardware Company, and J. W. Abbott, a jobber of hardware at Ogden. These witnesses testified that they add the freight charge to the manufacturers' price in fixing the price at which they sell their goods, the object being to show that the consumer pays the freight rate. They said that they were hampered in developing a distributing business by the lower rates on hardware made to the Pacific coast. Mr. Bauer stated, for example, that his concern pays the manufacturer $4 per 100 lbs. for nails, pays a freight rate on them from the East of $1.10, and sells them to retailers for $5.50 per 100 lbs. He said that in past times he had reduced the price of nails when the freight rate had been reduced.

C. F. Dillard, commerce counsel of the Harriman Lines, on cross-examination, asked questions which developed the fact that the Salt Lake Hardware Company does a business of about $2,000,000 a year and makes an average profit of about 15 per cent. net. Mr. Dillard asked Mr. Bauer what he thought was a fair profit on a business investment, and he said he thought about 10 per cent. Mr. Dillard then asked him if it were shown that the Hariman Lines did not earn more than 9 per cent. on a fair valuation if he would think their earnings were excessive, and he replied that he would not.

Mr. Abbott testified that his concern is doing a business of about $750,000 a year. Ninety per cent. of the goods it handles are shipped from east of the Missouri river. His business is solicited less by representatives of railways than formerly, which he attributed to combinations that have reduced railway competition. The transportation service, he said, has not been improved. He thought he could do a more prosperous business on existing rates than on lower ones, because lower rates would increase competition against him in his own territory; but the reduction in rates would be beneficial to the intermountain country in general. He stated that he sells goods in Idaho, Wyoming, Utah, Nevada and Arizona. In reply to a question from Mr. Dillard, he expressed the opinion that if the Harriman Lines are not earning more than 8 per cent. their profits are not unreasonable. Judge Dillard asked him if it should be shown that the net earnings of the Harriman Lines on traffic in the intermountain country are not higher than 6 per cent. if he would think them unreasonable, and he answered in the negative. He stated that his concern makes an average profit of 15 per cent.

The next witness called was J. A. Munroe, freight traffic manager of the Union Pacific. Mr. Munroe testified to a gradual reduction of the rates to Ogden and Salt Lake City. Some years ago the first-class rate to Ogden was $3 and to Salt Lake City, $3.30; it is now $2.05. In the course of his testimony he made a thorough analysis of the entire transcontinental rate situation. He said that distance is an important factor in the fixing of rates, but contended that the conditions in the country west of the Missouri river are such that mileage must in many cases be entirely disregarded. He said that the rates to Salt Lake are based on the rates fixed by the northern lines to Montana. Commissioner Prouty interrupted him to say that the officers of the Northern Pacific had testified that the rate to Montana was based on the rate to Salt Lake.

Mr. Munroe said that there is no material relationship between the rates to Colorado and the rates to Utah. In 1906 a reduction from $2.30 to $2.05 was made to Utah common points from the Missouri river, while no reduction was made to Colorado. There had also been several other changes in the rates to one of these states without a corresponding change to the other. It was shown that the rates on business moving from the Missouri river to the Pacific coast are divided on a basis of 54 and 46 per cent., the former going to the lines east of Ogden. It was also shown that there is maintained a constant relation between the local rates between the Missouri river and Salt Lake and the local rates between Salt Lake and the Pacific coast, the latter being always 75 per cent. of the former.

Mr. Munroe contended that the important rates for a community are not those made to jobbers on goods moving into it, but those made on its products moving out to other markets. He said that the jobbers' rates to Salt Lake are reasonable and that the jobber in Salt Lake is getting more for his service in taking goods from the cars and selling them to the retailer than the carrier is getting for hauling them from the Atlantic seaboard to Salt Lake. The real criterion of the fairness and reasonableness of rates is whether they enbaled the traffic to so move as to promote the prosperity of the country. Measured by this criterion, he contended, both the rates into Salt Lake and those on products moving out of the intermountain country are reasonable. These rates move the traffic and enable the shippers to make a profit, while they do not return to any of the railways engaged in the business an ordinary commercial return.

Regarding the rates from the East to the Pacific coast, Mr. Munroe said that they were made extremely low to meet water competition. The roads make, of course, some profit on this business or they would not seek it, but if these rates are to be taken as the criterion of the reasonableness of their rates where they do not meet water competition they will have to retire entirely from the Pacific coast business. He contended that if it should be found that their rates to the intermountain counry were excessive the rates to all parts of that country should be reduced proporionately instead of giving any one community the entire benefit of any reduction that should be made. To illustrate how rates are made to promote the development of the intermountain country, Mr. Munroe referred to the rate on potatoes from Idaho Falls to Texas. These rates are 64 and 68 cents, being but 10 cents per 100 lbs. higher than the rates on potatoes from Greeley, Colo., to Texas points, despite a relatively much larger difference in distances. The low rates from Idaho Falls are made to enable potatoes produced in that part of the country to compete with Colorado potatoes in the Texas market, but if they are to be taken as the criterion of the reasonableness of the rates from Greeley and other points nearer the Texas market they will have to be raised, because it would be impossible for the road to move all potatoes on rates as low per ton per mile as that from Idaho Falls.

Regarding the matter of service, Mr. Munroe said that the fastest freight schedule at present between Omaha and Ogden is 100 hours. The fastest schedule that ever was made was 23 hours, but this was a war schedule, and it was utterly impracticable to maintain it. The schedule was subsequently increased to 63 hours, afterwards to 87 hours and still later to 100 hours. The witness contended that service which is relatively slow, but regular, is better than fast schedules which are but irregularly maintained. Regarding the improvements in the Union Pacific, he said that this had extended to all parts of the line and that among other things its length between Omaha and Ogden has been reduced from 1,032 miles to about 1,000 miles. The cost of operation has been greatly reduced, but he had been told by operating officers of the line that the operating ratio was lower in 1908 that it could be hoped that it would in future. The road's earnings in 1908 were a trifle over 10 mills per ton per mile.

Mr. Munroe said that prior to the enactment of the Hepburn law rebating was very common, but that he believed the amount of it was exaggerated. He thought that the rebates given by the Union Pacific amounted on the average to about 10 per cent. of its freight earnings. If published rates were

the same now as then it would be true that the actual rates collected were higher now than then, because the railways now collect their published rates. But Mr. Munroe contended that on the average rates are lower now than in the days of rebating and that, consequently, while all shippers are given the same rates, the railways derive no higher average revenue from the traffic.

Reverting to the matter of transcontinental freight rates, he said that when the earnings from any particular traffic gets as low as 5 mills per ton per mile they are scrutinized by the Union Pacific, very closely and that the road greatly hesitates to accept any traffic which will yield less revenue than this. His attention was called to the fact that new roads have recently been built to the Pacific coast, which must depend chiefly on the business to the Pacific coast for freight earnings, and was asked how he reconciled this fact with his contention that if the rates to the Pacific coast had to be taken as the criterion of all rates the railways would have to retire from the Pacific coast business. These roads, he replied, would not depend entirely on traffic moving to the Pacific coast, but would also derive revenue from the traffic moving from the Pacific coast to the East.

He said that he believed the Hepburn act had been of great benefit to the railways, as without it competition between them probably would have been so unbridled that many more would have gone into bankruptcy. At the same time the law had benefited shippers, as it had made for stability of rates and had stopped discrimination. He was asked why the rates per ton per mile were higher between the Missouri river and Ogden than between Chicago and the Missouri river, and he replied that this probably is due to the fact that there are more railways between Chicago and the Missouri river, and, consequently, more constant "hammering" of rates.

George W. Luce, freight traffic manager of the Southern Pacific, was the next witness. He stated that the mileage of the Southern Pacific, owing to reconstruction of part of the line, has been reduced from 833 to 786 miles. It was brought out that rates east and west on the Southern Pacific (Central Pacific) between Ogden and San Francisco differ, but Mr. Luce stated that it is the intention to make these rates the same. He testified that the rate on citrus and deciduous fruits from the coast to Salt Lake is the same as it is to the Missouri river and points farther east, being $1.15. Formerly, he said, the rate to New York was $1.25 and the rate to Salt Lake was $1.12½. The rate to Salt Lake was raised and that to New York was reduced to $1.15, in order to give the grower equal ability to enter all markets. He said that if the Southern Pacific must use its rates on transcontinental business as a measure of the reasonableness of all its rates it would soon be bankrupt. He stated that 97 per cent. of the business of the old Central Pacific line of the Southern Pacific is transcontinental traffic which is moved on commodity rates. The Southern Pacific has in effect 1,800 commodity rates to the coast, which are made to meet water competition, and class rates are not as high as they would be but for water competition. Mr. Babcock stated that his check showed that the Southern Pacific has commodity rates on 3,874 articles. Mr. Luce replied that the discrepancy between the figures, no doubt, is due to the fact that the same rate may apply to more than one article. Water rates, Mr. Luce said, are usually from 70 to 80 per cent. of the rail rates. In many cases low rates are made eastbound as well as westbound to meet water competition. For example, a rate of 2.07½ cents per 100 lbs. is made on wool through to the Pacific coast by rail and by water from there to New York, or all rail via Omaha.

Regarding rebating, Mr. Luce said that there was very little of this on the Southern Pacific prior to the passage of the Hepburn act, because this road met very little competition from other lines, and could, therefore, maintain its published tariffs. He did not think that the rebates given would amount to more than 1 per cent. of its earnings. Water competition, he said, is increasing because the steamship lines are giving better and more frequent service.

F. A. Wann, general traffic manager of the San Pedro, Los Angeles & Salt Lake, testified that this road does not attempt to handle any freight business between Salt Lake and San Francisco because he does not believe such traffic would be profitable to it. On the other hand, the Southern Pacific does handle traffic between Los Angeles and Salt Lake. The Southern Pacific, he said, could afford to engage in the Los Angeles-Salt Lake business while the San Pedro could not afford to engage in the San Francisco-Salt Lake business, because in the former case the Southern Pacific gets the entire rate while in the latter the San Pedro would get only a part of it. He stated that the rates between Los Angeles and Salt Lake are not the same in both directions, being $1.78 westbound and $1.54 east bound, first class, but that they should be the same, and that it is intended to make them so.

S. H. Babcock, commissioner of the Salt Lake Traffic Bureau and formerly assistant general traffic manager of the Denver & Rio Grande, submitted various statements regarding the rates to and traffic conditions in the intermountain country. Mr. Babcock said that, based on his experience in the railway business he considered the present rates from the East to the Pacific coast as reasonable and that the rates to Salt Lake and other intermountain points might reasonably be established on a proportionate mileage basis. He thought that commodity rates are now higher than when he was in railway service. He considered transcontinental traffic remunerative when he was connected with the Denver & Rio Grande, and stated that during the last year that the Rio Grande Western was operated as an independent road, ending June 30, 1901, 22 per cent. of its traffic between the territory east of the Rocky mountains and California was transcontinental business.

He was asked whether in his opinion the scheme of "blanketing" rates between the East and California was of benefit to the latter state, and replied in the affirmative, stating that it gives the shippers of that state a market at practically the same rates throughout the country. He contended that it would not be fair to Utah merely to reduce its rates so as to make them the same as those to the Pacific coast, but that they should be made as much lower in proportion as the mileage from the East to Salt Lake is less than the mileage to San Francisco.

Mr. Dillard, of the Harriman Lines, asked Mr. Babcock, "What is a reasonable freight rate?" He replied that it is "one that you have to make to get the traffic. It is governed by conditions; competition figures to a considerable extent."

"Then," said Mr. Dillard, "the whole basis of your complaint is false, for you have built your complaint on a mileage basis, have you not?" Mr. Babcock replied that conditions had to govern in all cases and that conferences were necessary at times to fix rates. Mr. Dillard, referring to the portions of the Salt Lake complaint, in which it is alleged that the rates are unreasonable because they are not on a mileage basis, and the carriers are accused of violating both the economic and public law by conferring before fixing rates, said: "If the conditions surrounding traffic determine the rates, and if the rates should be built after conferences, how does your complaint have any standing in the face of your definition of what is necessary in making a rate?"

Mr. Babcock replied that he thought the mileage basis reasonable to all concerned. Mr. Dillard then asked: "Is not a reasonable rate one on which traffic moves freely, which allows a fair profit to the producer and to the distributor and puts the products in the hands of the consumer at a price not unduly high?" Mr. Babcock replied that this seemed a fair definition, but that a rate might be unreasonable because of discrimination. He thought there might be a tendency to make rates high into a new country. "Traffic moves freely on the present rates to Salt Lake, does it not?" asked Mr. Dillard. "All the traffic there is here moves," was the reply. He was asked if he was not complaining of the unreasonableness of the earnings of certain roads rather than of the unreasonableness of their rates. He replied that the roads with their large earnings should make reasonable rates and that the Union Pacific has big earnings per mile and is a good road.

S. H. Love, traffic manager of the Zion Co-Operative Mercantile Institution, said that the freight rates to Salt Lake amount to about 30 per cent. of the value of the goods. He severely criticized the service given by the railways in the movement of freight. He said that he would be satisfied if the same rates were applied to Salt Lake City as to the coast, but that he did not think this would be a just rate.

Julius Kruttschnitt, director of maintenance and operation of the Harriman System, gave testimony regarding the valua-

tion of the Union Pacific, the Oregon Short Line and the Oregon Railroad & Navigation Company. He stated that their value in 1897 was $327,836,924, and that by improvements this had been increased in 1899 to $348,852,320. The figures he submitted showed that the present valuation of the properties, owing to extensive improvements, is $441,534,509, showing that during the past 12 years about $114,000,000 has been spent on improvements. He stated that 945 miles of railway have been built by the Harriman system under his supervision at an average cost of about $118,000 a mile. There were two or three pieces of abnormally extensive construction ranging in cost from $192,000 to $1,100,000 a mile. He estimated that the true value of the Union Pacific at present is over $80,000 a mile.

Mr. Kruttschnitt gave statistics regarding the percentage of increase of the wages of various classes of railway employees. He added that the figures he gave were not fairly indicative of the actual increase in the compensation, for hours of labor have been reduced. All classes of railway employees that he had mentioned are paid overtime, and the overtime rates also have risen from 40 to 50 per cent. since 1897. As overtime rates form a considerable percentage of the total compensation of the men, the increase in compensation is higher than the increase shown in the actual wage per mile or per month. Mr. Kruttschnitt also gave statistics regarding increases in the prices of railway supplies. Referring to the price of coal, he alluded to the fact that the Union Pacific owns its own mines and frankly said that he thought his own conduct in the past, as president of the coal company in fixing a lower price to the road than was charged to the public was reprehensible, and ought to be changed. In his estimate of the value of the Union Pacific he had not included the value of the coal properties. He thought that the value of these properties should be included because their ownership has been a potent means of reducing the operating expenses of the Union Pacific. Their value is between $11,000,000 and $12,000,000, which adds about $2,000 a mile to the entire valuation of the Union Pacific road; and the arbitrary prices fixed for coal to the Union Pacific lines has saved them from $800,000 to $900,000 a year in operating expenses. The coal had been sold to the railway for 41 cents a ton less than the market price. Referring to the freight service given by the Union Pacific, Mr. Kruttschnitt said that the schedule time from Omaha to Ogden is 100 hours and that the records show that 83 per cent. of the road's trains arrive at the terminals on time. This schedule is practically 10 miles an hour from Council Bluffs on freight moving 1,000 miles largely over single tracks with an average of 12 to 13 trains each way, giving 13 times 13 meeting points which trains have to make on single track. No other road, Mr. Kruttschnitt said, maintains a speed of 10 miles an hour on single track for over 1,000 miles. The Union Pacific also, he said, shows the largest average daily movement per freight car of any railway in the United States.

Demurrage Meeting.

A meeting of the sub-committee on demurrage of the National Association of Railway Commissioners was held in Chicago on September 25, and a meeting of the entire committee was held in Chicago Sept. 27. The following railway commissioners were present: Commissioner Franklin K. Lane, Interstate Commerce Commission, chairman; A. F. Gates, Connecticut commission; John W. Boyd, Pennsylvania commission; William H. Rhea, Virginia commission; John A. Webb, Missouri commission; W. L. Eaton, Iowa commission; J. C. Gothlin, Ohio commission; H. T. Clarke, Nebraska commission, and H. Erickson, Wisconsin commission. The matter of the report which the committee will make to the National Association of Railway Commissioners on uniform demurrage rules was fully considered, and it seems probable that, as a result of the meeting, recommendations will be made which will differ in some material points from the tentative rules, which it seemed probable, after the meeting in Washington in June, the committee would recommend. It had been hoped that the committee would recommend rules which could be at once adopted by the American Railway Association. The National Association of Railway Commissioners will meet at Washington on November 16, and the American Railway Association in Chicago on October 17.

President Baer on the Price of Anthracite Coal.

George F. Baer, president of the Philadelphia & Reading, testifying last Monday in Philadelphia at the hearing of the government's suit to dissolve the alleged hard coal trust, said that there had never been an agreement, combination, or conspiracy, between his companies and any other coal or railway companies to control the output or sale of anthracite coal. Mr. Baer spoke for both the Reading companies and the Central of New Jersey; also the Lehigh & Wilkes-Barre Coal Company. He entered a specific denial to all the charges contained in the complaint of the government filed June, 1907. He denied that a monopoly existed in the anthracite region; that the independent operators were forced to accept the 65 per cent. basis on which they sell their coal to the coal-carrying roads, and that there is an attempt at division of the coal production. The uniform price charged for anthracite coal was not the result of an agreement. The Reading Company, he said, was under greater expense than any other company in producing coal, and it fixed a fair price. The others followed and reaped a greater profit. "The price," said he, "of the entire supply of anything necessary for a community will be regulated by the cost of production of that portion of the necessary supply which is produced at the greatest expense."

Taking up the last increase of 50 cents a ton in domestic sizes after the strike of 1902, Mr. Baer said the increase in wages and other expenses resulting from the strike would have caused the company to operate at a loss or shut down had not the price been raised.

"Our experts showed," said he, "that the increase amounted to 75 or 80 cents a ton, and our sales agents wanted me to increase the price of coal 75 cents a ton. I concluded, however, that 50 cents would be fair for domestic sizes. We refused to sell coal to any dealer who went above our prices. We tried to protect the public in every way.

"The public must not forget that 40 per cent. of the output of the Reading Company is sold below cost of production. The public estimates coal profits on the prices of domestic sizes, and does not take into consideration the low cost of steam sizes."

Mr. Baer denied that the New Jersey Central was acquired to shut off competition. He said the Jersey Central had the best harbor facilities in New York harbor for shipping coal, and had enough land for 100 years to come for expansion.

He heard that the road was for sale, and went to J. P. Morgan and told him that the Reading needed it for a New York terminus. Mr. Morgan told Mr. Baer to investigate, and the result was that the Jersey Central was secured by the Reading, not to stifle competition, Mr. Baer said, but to prevent competing companies from ruining the Reading.

The Temple Iron Company, the capital stock of which is owned by the majority of the hard coal carrying roads, acquired certain collieries, Mr. Baer said, to save the credit of the Erie Company.

Mr. Baer was cross-examined by James B. McReynolds, special assistant to the United States Attorney-General. The witness said that all the roads shipping anthracite coal to New York were competitors. Mr. McReynolds then got from Mr. Baer the statement that the Reading held a controlling interest in the Jersey Central and had a large interest in the Lehigh Valley. The Jersey Central stock, Mr. Baer testified, was acquired in 1901, and the same traffic arrangements existed now that existed prior to the acquisition.

STATE COMMISSIONS.

The New York State Public Service Commission, First district, has refused an application from citizens for an order directing the establishment of a new station on the Interborough Rapid Transit subway at St. Nicholas avenue and One Hundred and Seventy-fifth street.

The New York State Public Service Commission, Second district, has approved of the abandonment of a part of the route of the Hudson Valley (electric) Railway along the Waterford and Whitehall turnpike, in the region of the Champlain canal and the south branch of the Hudson river, the main branch of the Hudson river and the power canal of the American Box

Board & Paper Co. This road is to be abandoned because of the location of the barge canal through the territory referred to. A new railway line is to be built on another location to take the place of the one abandoned.

New York: Third Avenue Reorganization Plan Rejected.

The Public Service Commission, First district, has denied the application of the bondholders' committee for approval of the proposed issue of bonds and stock for the reorganization of the Third Avenue Railroad. The application was made by James N. Wallace, Adrian Iselin, Edmund D. Randolph, Mortimer L. Schiff, James Rimpson and Harry Bronner, composing the bondholders' committee of bonds issued under the first consolidated mortgage of the railway, dated May 15, 1900. They asked the commission to approve the issue of $16,516,800 of refunding mortgage bonds, $32,000,000 of adjustment mortgage 5 per cent. cumulative bonds and $20,000,000 of capital stock by a new company contemplated in the plan of reorganization. The commission holds that the applicants have failed to prove that there are assets or property of sufficient value to justify a capitalization of $68,516,000. In the absence of proof the commission will not approve, for no reorganization can be sound or permanent unless capitalization has some relation to value.

There are strong indications that the present company is overcapitalized and that the outstanding stock and bonds—$58,560,000—are not represented by actual property. The net earnings will probably be less than the estimate given by the receiver, certain items having been omitted. But even accepting his estimate, there is no evidence whatever to show that the new company would earn a sufficient net income to pay interest upon the adjustment bonds, par value $32,000,000, after paying operating expenses, taxes and interest on prior liens. On the applicants' theory, there is no evidence to indicate that any dividend would be paid upon the common stock, par value $20,000,000. The issuance of securities with so great a probability that adequate interest and dividends will not be earned thereon is without justification, is dangerous financiering, and injurious to the public. The issuance of securities does not make value. Such extreme overcapitalization would lead, as it has in the past, to inferior service and unwarranted exactions. The people of New York have too vivid evidence upon this point to forget its importance.

The control of the corporation would pass from the stockholders to the bondholders, with little probability of its return for many years, if ever. This is true notwithstanding the fact that the stockholders are to be called upon for $4,000,000. The value of the property to be acquired, as indicated by market value of the securities, is very much less than the amount of the securities proposed to be issued. Market value cannot be used, therefore, to justify the proposed issues. The reorganization plan involves the capitalization of taxes, unpaid interest, repairs, renewals and other improper capital charges, which is unjustifiable and inexpedient.

In denying the application the commission decides that the corporation has no reasonable need for the added capital. The opinion shows that it would be either 12 years or 29 years before the stockholders would get their first dividend, and the agreement is so drawn that the stockholders could be kept out of control indefinitely.

COURT NEWS.

The Oklahoma supreme court has decided that an appeal will not lie from the State Corporation Commission to the court from orders issued by the commission requiring railways to make detailed reports of all accidents to date, and has dismissed appeals from the order taken by the Atchison, Topeka & Santa Fe and the St. Louis & San Francisco.

Equity proceedings have been begun in the federal court at Philadelphia by the Philadelphia & Reading, the Baltimore & Ohio, the Cumberland Valley, the Lehigh & New England and Berjain F. Bush, receiver of the Western Maryland, to restrain the Interstate Commission from enforcing its order fixing the rate to be charged for transporting certain bituminous coal. The plaintiffs charge that a loss of $150,000 will be incurred. It is therefore contended that the effect will be to take the property of the carriers without due process of law.

The Oklahoma supreme court has ruled against the State Corporation Commission in a case in which a railway appealed from an order of the commission requiring it to build a track to a mill owned by J. B. Davis at Gage, Okla. The expense of building the track after it left the road's right-of-way was to be paid by Davis. The court said that a railway cannot be required to equalize disadvantages which concerns located off its right-of-way may have in comparison with concerns located on its right-of-way. Proceedings in such cases should be brought under Section 33, Article 9, of the state constitution, which authorizes the commission to order a side-track to be paid for by the parties benefited.

The Missouri, Kansas & Texas, the Atchison, Topeka & Santa Fe and the Gulf, Colorado & Santa Fe filed petitions in the United States circuit court for the western district of Oklahoma at Guthrie on September 25 for injunctions to prohibit the officials of Oklahoma from enforcing the 2-cent passenger fare fixed by the constitution as well as practically all the freight rates that have been put into effect by the corporation commission since Oklahoma was admitted to statehood. The Missouri, Kansas & Texas alleges that it suffered a net loss during 1908 of $156,698 on freight business in Oklahoma and that its net revenue from passenger traffic in the state in that year was only $24,497. The Atchison, Topeka & Santa Fe alleges that it suffered a net loss on freight business in the state during the year ended December 31, 1908, of $215,395, and that its loss owing to orders of the commission in 1909 up to June 30 was $205,027.

The Nebraska supreme court rendered a decision on September 25 upholding the constitutionality of the Sibley law, which requires a reduction in all express rates in Nebraska, the basis being 25 per cent. below those in effect prior to January 1, 1907. The court said that statutes fixing the rates of public service corporations must be presumed to be constitutional. When an attempt is made to have them held unconstitutional, it is incumbent on the attacking carrier to make a full and fair disclosure of its receipts and disbursements. A court has not the power to hold such an act of the legislature unconstitutional before a fair trial has been made of the operation of the law. Where it reasonably appears from a consideration of all the evidence that the rates complained of are not confiscatory but afford the express company at least some measure of profit the court will not interfere with the statute, but will refer the complaining party to the rate-making power.

The New York State Supreme Court, Appellate division, has handed down a decision remanding to the Public Service Commission, for reconsideration, the decision of the commission denying to the Delaware & Hudson Company the power to issue about $13,000,000 in bonds to refund its indebtedness for control of a street railway and for the purchase of certain coal lands. From an unofficial abstract of the court's decision we quote the following: Presiding Justice Smith and Justices Cochrane and Chester hold that the bonds, being amply secured, the public is protected, and the commission should have approved the issue as a matter of discretion Justices Kellogg and Sewell hold that if the debts which it was proposed to refund were owing at the time of the passage of the public service commissions law, and were for any of the purposes named in Section 55 of the law, the commission is without discretion and that to hold otherwise would be to render doubtful the constitutionality of the act. Justice Kellogg says that it is not a function of the commission to save the company from itself, or from the honest but unwise act of its officers and stockholders, in whom alone the statute has vested the power to manage the company's property and business; but rather the commission is to protect the public from the wrongful issue of stocks and securities in which the public is likely to deal. Justice Smith says that he is not ready to agree that the commission is required to authorize the issuance of bonds like those proposed in all cases, provided the conditions of the statute are fulfilled; "I think the commission might withhold its approval, for the protection of the public, but this power would seem to be denied by the logic of Justice Kellogg's opinion."

Railroad Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

The offices of E. L. Bemiss, second vice-president, and W. H. Alexander, auditor of the Georgia & Florida, have been transferred from Douglas, Ga., to Augusta.

H. W. Seaman, president of the Tremont & Gulf, has been elected president of the Minneapolis & Rainy River, with office at Chicago, succeeding Thomas Hume, resigned.

G. W. Webster has been elected secretary of the Minneapolis, St. Paul & Sault Ste. Marie, with office at Minneapolis, Minn., succeeding C. F. Clement, formerly secretary and treasurer. Mr. Clement has been re-elected treasurer.

H. A. Gausewitz, recently appointed general superintendent of the Fort Worth & Denver City at Fort Worth, Tex., has been appointed also general superintendent of the Wichita Valley, with office at Wichita Falls, Tex., succeeding G. F. Cotter, resigned.

A. S. Hale has been elected assistant treasurer and secretary, and has also been appointed auditor of the Macon, Dublin & Savannah, with office at Macon, Ga., succeeding C. G. Smith, recently resigned to become examiner of accounts for the Interstate Commerce Commission at Washington, D. C.

W. C. Parker, auditor of the Southern Pacific Company Atlantic Steamship Lines at New York, has been appointed auditor of the Houston & Texas Central, the Houston East & West Texas and the Houston & Shreveport, with office at Houston, Tex., succeeding C. C. Barry, resigned to go to the Guffey Oil Co., of Beaumont, Tex. B. G. Bartholomew, freight auditor of the Galveston, Harrisburg & San Antonio and the Texas & New Orleans at Houston, succeeds Mr. Parker, with office at New York.

The jurisdiction of several officers of the Toledo, St. Louis & Western and of the Chicago & Alton has been extended also over the Iowa Central and the Minneapolis & St. Louis. Edwin Hawley, president of the Iowa Central and the Minneapolis & St. Louis and vice-president of the Chicago & Alton and the Toledo, St. Louis & Western, has been elected chairman of the board of each of these roads. T. P. Shonts, president of the Toledo, St. Louis & Western and the Chicago & Alton, has been elected president of the Iowa Central and the Minneapolis & St. Louis. G. H. Ross, senior vice-president of the Chicago & Alton and the Toledo, St. Louis & Western, has been elected vice-president of the Iowa Central and the Minnapolis & St. Louis. W. L. Ross, vice-president in charge of traffic of the Toledo, St. Louis & Western has been elected vice-president in charge of traffic of the Iowa Central and the Minneapolis & St. Louis. Other official changes announced are the following: F. H. Davis, vice-president of the Iowa Central, has been elected vice-president and treasurer of these four roads; A. C. Doan, secretary of the Iowa Central and the Minneapolis & St. Louis, has been elected secretary of all four roads; W. W. Cole, assistant treasurer of the Iowa Central, has been elected assistant treasurer of all four roads, and E. S. Benson has been elected controller of all four roads.

Operating Officers.

The office of J. M. Turner, general manager of the Georgia & Florida, has been transferred from Douglas, Ga., to Augusta.

H. W. Clarke, assistant general manager of the International & Great Northern at Palestine, Tex., has resigned to go with another company, effective October 1.

S. H. Charles, assistant superintendent of the St. Louis & San Francisco at Fort Scott, Kan., has been appointed acting superintendent of the Southeastern division, with office at Birmingham, Ala., succeeding J. G. Lorton, granted leave of absence.

A. A. Tisdale, assistant to the vice-president and general manager of the Grand Trunk Pacific at Montreal, Que., has been appointed superintendent of the 450 miles of the National Transcontinental between Winnipeg, Man., and Fort William, Ont., with charge of terminals at Fort William and office at the same place. Mr. Tisdale began railway work in the local freight offices of the Grand Trunk at Hamilton, Ont. He was successively private secretary to the general superintendent, assistant to the vice-president, and later assistant to the vice-president and general manager, which position he held until his recent appointment as superintendent.

Benjamin R. Pollock, superintendent of the Midland division of the New York, New Haven & Hartford, with office at Hartford, Conn., has been appointed general superintendent, with office at New Haven, Conn., succeeding W. G. Bierd, resigned. Mr. Pollock was born on January 2, 1865, at Lansford, Pa. He was educated in the public schools and began work with the Lehigh Coal & Navigation Co. in 1879 as an operator, remaining until 1881, when he went to the New York & New England, which later became the New England Railroad and was absorbed in 1898 by the New York, New Haven & Hartford. From 1881 to 1898 he was successively telegraph operator, train despatcher, chief despatcher, trainmaster and assistant superintendent. In 1898 he was appointed assistant superintendent of the Highland division of the New York, New Haven & Hartford, remaining in that position until January, 1904, when he became superintendent of the Air Line Northampton division of the same road at New Haven. The following December he was appointed superintendent of the Highland division, and later was made superintendent of the Midland division, which position he held until his recent appointment. Mr. Pollock is the same B. R. Pollock who took the first prize for fast sending at a telegraphers' speed contest in New York City in 1893.

B. R. Pollock.

Traffic Officers.

E. B. Jones has been appointed a traveling passenger agent of the Erie, with office at Boston, Mass.

Harry Hill has been appointed a commercial agent of the Macon & Birmingham, with office at Nashville, Tenn., succeeding George J. Allen, resigned.

H. H. Taylor, eastbound freight agent of the Wabash at St. Louis, Mo., has been appointed a commercial agent of the International & Great Northern, with office at St. Louis, Mo.

J. B. Wenger, recently resigned as traveling freight agent of the Central of Georgia at St. Louis, Mo., has been appointed traffic manager of the Cairo Milling Co., with office at Cairo, Ill.

Seth K. Martin, formerly commercial agent of the Rock Island-Frisco Lines in Denver, Colo., has been appointed general freight and passenger agent of the Denver, Laramie & Northwestern, with office at Denver.

S. L. Parrott, district passenger agent of the Rock Island-Frisco Lines at Atlanta, Ga., has been appointed general New England agent of the Rock Island Lines in charge of freight and passenger business, with office at Boston, Mass.

S. A. Williams, commercial agent of the Queen & Crescent Despatch, the Alabama Great Southern and the Cincinnati, New Orleans & Texas Pacific at New Orleans, La., has resigned to engage in other business at Jacksonville, Fla.

S. S. Butler, general agent, freight department, of the Rock Island-Frisco System at Fort Smith, Ark., has been appointed

general agent of the New York district, with office at New York. Roy Robinson, contracting freight agent at Fort Smith, succeeds Mr. Butler.

C. S. Jeffries has been appointed westbound freight agent of the Wabash, with office at St. Louis, Mo., succeeding B. H. Coyle, promoted, and G. L. Kaeshoefer has been appointed eastbound freight agent, with office at St. Louis, succeeding H. H. Taylor, resigned.

Charles F. McTague, general eastern freight agent of the Delaware, Lackawanna & Western at New York, has been appointed an assistant general freight agent, with office at Buffalo, N. Y., succeeding W. E. Dowle, who leaves the company of his own volition after many years of service, to go into other business, effective November 1.

The Wabash has established an agency for freight and passenger business at Seattle, Wash., for the state of Washington and British Columbia. W. D. Stubbs, general agent at Portland, Ore., will have charge of the Seattle office. F. H. Wegener, depot passenger agent at St. Louis, Mo., has been appointed a traveling freight and passenger agent, with office at Seattle, and will report to Mr. Stubbs. H. C. Shields, traveling passenger agent at Kansas City, Mo., has been appointed general agent, passenger department, with office at Omaha, Neb., succeeding H. E. Moores, resigned. F. D. Hammer, passenger agent at Kansas City, succeeds Mr. Shields.

V. D. Fort, whose appointment as general freight agent of the Illinois Central, with office at Chicago, has been announced in these columns, was born January 29, 1870, at Cedar Rapids, Iowa. He received a common school education and began railway work in 1885 as clerk in the office of the Burlington, Cedar Rapids & Northern, now a part of the Chicago, Rock Island & Pacific, at Cedar Rapids, Iowa. Later he became clerk in the general freight department, and from 1888 to 1892 he was chief tariff clerk for the Chicago Great Western. In the latter year he was made chief tariff clerk of the Illinois Central and afterwards became chief clerk in the general freight department. He was appointed assistant general freight agent on October 21, 1901, which position he held until his recent appointment as general freight agent of the Illinois Central and the Indianapolis Southern.

J. L. Smith, whose appointment as general eastern passenger agent of the Delaware, Lackawanna & Western at New York was recently announced in these columns, was born in March, 1866, at Candor, N. Y. He began railway work in September, 1889, at Elmira, N. Y., with the Delaware, Lackawanna & Western, and has since been in continuous service with that company. He was ticket clerk at Elmira for about six years, city passenger agent at Buffalo for three years, and for the two years following city ticket agent at New York. He was then transferred to Binghamton, remaining there for four years as ticket agent. He returned to New York as city passenger agent, where he remained two years, and was then for two years division passenger agent at Syracuse. About a year ago he was appointed division passenger agent at Newark, N. J., which position he held until his recent appointment.

Engineering and Rolling Stock Officers.

The office of W. A. Swallow, chief engineer of the Georgia & Florida, has been transferred from Douglas, Ga., to Augusta.

The office of F. Wolsifer, supervisor of the Wabash, has been transferred from Defiance, Ohio, to Toledo. He is in charge of both the Montpelier and the Defiance divisions.

H. H. Hale, who recently resigned as master mechanic of the Gulf & Ship Island, has been appointed a master mechanic of the Cincinnati, Hamilton & Dayton, with office at Lima, Ohio.

G. N. Howson, master mechanic of the Southern Railway at Alexandria, Va., has been transferred to Princeton, Ind., succeeding C. M. Hoffman, resigned. E. C. Sasser, master mechanic at Charleston, S. C., succeeds Mr. Howson and C. H. Kadie succeeds Mr. Sasser.

Purchasing Officers.

The office of A. M. Miller, purchasing agent of the Georgia & Florida, has been transferred from Douglas, Ga., to Augusta.

Railroad Construction.

New Incorporations, Surveys, Etc.

ALBERTA & GREAT WATER WAY.—Bonds are said to have been sold and contracts are to be let at once for building 30 miles from Edmonton, Alb., north. Additional contracts are to be let soon. The line is projected from Edmonton, Alb., north to Fort McMurray and surveys are nearing completion. The Alberta Government has guaranteed the company's bonds and granted a cash subsidy, also $400,000 for terminals at Fort McMurray. E. A. James is manager, with office at Edmonton. William R. Clarke, of Kansas City, Mo., is also interested. (March 12, p. 523.)

ALBERTA CENTRAL.—Surveys are said to be under way east and west of Red Deer, Alb. A subsidy has been granted the company to build from Red Deer west to the Rocky mountains, 70 miles, and plans made to build from near Rocky Mountain House to the Grand Trunk Pacific near Yellow Head Pass; from Battle river to Saskatoon, Sask., or Worman; also east from Red Deer southeasterly to Moosejaw. Smith & Johnson, solicitors, Ottawa, Ont. J. T. Moore, Red Deer, may be addressed. (March 19, p. 659.)

ALEXANDRIA & WESTERN.—Plans are being made to organize this company, with $25,000 capital, to build in Louisiana along the south bank of Bayou Rapides into the pine woods west of Alexandria and eventually via Leesville to the Sabine river and later into Texas. G. F. Cotter, president, of Fort Worth, Tex.

BOSTON & MAINE.—An officer writes that the improvements being carried out involve laying 15,000 tons of new rail, all of which will be in place before the coming winter. This includes 5,000 tons of open hearth rail for the Fitchburg division. Contract was recently let for putting up an engine house and a repair shop at East Fitchburg; a lumber shed, 300 ft. by 150 ft., has been authorized. A third track is to be laid from Fitchburg to East Fitchburg, all the intervening bridges are to be widened and all crossings are to be taken out. Some heavy work is under way at several places eliminating grade crossings. Plans are being made for a locomotive shop 170 ft. by 200 ft., to be built at East Somerville; for a street bridge to carry Lowell street over eight tracks at Somerville Junction, coal plants at various points and a large deck bridge at North Hoosick. The question of putting up a paint shop 110 ft. x 480 ft. at East Fitchburg, as well as engine houses and yards at other points, and building a large transfer house at Rotterdam Junction are under consideration.

CANADIAN NORTHERN ONTARIO.—Contract is said to have been let for building the first section of 104 miles from Toronto, Ont., east to Trenton. Work is to be started at once. (Sept. 24, p. 562.)

CANADIAN PACIFIC.—An officer is quoted as saying that work will be started soon double-tracking the main line between Winnipeg, Man., and Brandon, 131 miles.

CENTRAL OREGON & PACIFIC.—Preliminary surveys are said to be under way from Brownsville, Ore., east. The line will pass through the center of the Calpoola valley, touching Crawfordsville and Holley. The plans call for a line from Albany, Ore., east across the Cascade range to Ontario, in Malheur county, on the Idaho boundary, 325 miles. F. T. Griffith, Oregon City, is an incorporator, and C. H. Warner is a director. The headquarters of the company are at Portland. (Aug. 20, p. 339.)

CHICAGO & NORTH WESTERN.—An officer writes that the contract has been let to the Winston Brothers Co. for the extension from Beile Fouche, S. Dak., east to the government town site, about 25 miles. (Sept. 17, p. 520.)

An officer of the Chicago & North Western denies that surveys have been made for a line from Lander, Wyo., west. (Sept. 17, p. 520.)

CHICAGO, MILWAUKEE & PUGET SOUND.—An officer writes regarding the reports that a line is to be built from Malden, on the present line in Whitman county, Wash., north to Spokane, about 35 miles; that the company will begin the construction

of a line into Spokane soon, but the point on the main line from which it is to be built has not yet been fully determined. It will probably be in the neighborhood of Malden. (Aug. 27, p. 383.)

CHICAGO ROADS.—An ordinance has been introduced in the City Council which provides that all railways operating cars or trains within a radius of eight miles of the City Hall, in the city of Chicago, shall be operated by electrical power. The Illinois Central electrification will be in six sections, as follows: First, suburban tracks, Randolph street to 63d street, from steam to protector third rail; second, express tracks to South Chicago, third rail; third, electrification Kensington tracks; fourth, electrification suburban and through passenger tracks to Burnside; fifth, passenger and freight tracks, between Park Row station and Burnside; sixth, passenger and freight tracks to Riverside. This includes all tracks within the city limits. See item on Proposed Ordinance Requiring Electrification of all Railways in Chicago, under General News.

CRAIG MOUNTAIN LUMBER CO. ROADS.—According to press reports a contract has been given to Grant Brothers, of Spokane, Wash., to build 5½ miles of line from Reubens, in Nez Perce county, Idaho. Work is to be started at once. W. C. Lawrence, Lewiston, Idaho, is the local manager of the Lumber company.

DENVER, LARAMIE & NORTHWESTERN.—This line is to be opened at once for operation between Denver, Colo., and Wattenberg, 23 miles. The grading and bridging on this line are complete almost to Greeley, Colo., and it is expected to begin operating the line between Denver and Greeley, 55 miles, by January 1. (July 23, p. 167.)

GRAND TRUNK PACIFIC.—A sub-contract for work on seven miles is said to have been given to J. A. Harvey, of Fort William, Ont., by the Nepigon Construction Co., at a point about 90 miles east of Nepigon. The same contractor has a 15-mile contract east of Lake Superior junction, all of which it is expected will be finished this year.

Grading contracts are said to have been given to Hy. Ouilette, J. Mainfant and F. Odette, all of Fort William, for a 10-mile section near North Bay, Ont.

GREAT NORTHERN.—The contract recently let for building the line from Great Falls, Mont., east to Belt, about 22 miles, is said to have been given to Cook, Deak & Hings, of Seattle, Wash., and work is to be started at once. (Sept. 24, p. 563.)

Surveys are said to have been finished at Coquila, B. C., for piercing a long tunnel on the line of the Vancouver, Victoria & Eastern. It is said the line will shorten the route about 30 miles between Vancouver and Princeton. The improvements will cost about $1,500,000.

GREEN BAY & WESTERN.—An officer writes that there is no truth in the report that the line between Marshland, Wis., and Winona, Minn., will in future be operated by electricity. (Sept. 24, p. 563.)

GULF, COLORADO & SANTA FE.—An officer is quoted as saying that the line to be built from the Lampasas branch, between Lampasas, Tex., and Brownwood, west to the western boundary of San Saba county, 45 miles, is to be extended an additional 80 miles to Eldorado, in Schleicher county. (Sept. 17, p. 520.)

GULF PORT & MISSISSIPPI COAST TRACTION.—According to press reports this line from Biloxi, Miss., west to Long Beach, 18 miles, which cost $1,000,000 to build, was almost entirely destroyed by recent storms and floods.

IDAHO SOUTHERN.—Work is said to be under way on a branch from Wendell, Idaho, west to Hagerman, about 15 miles. (Sept. 24, p. 563.)

ILLINOIS CENTRAL.—See Chicago Roads.

INDIANAPOLIS, NEW CASTLE & TOLEDO (ELECTRIC).—An officer writes that contracts were let early in September to J. T. Adams, of Columbus, Ohio, for work between Indianapolis, Ind., and New Castle, on the south side of the Pittsburgh & Erie division of the Cleveland, Cincinnati, Chicago & St. Louis, about 18 miles. The contract includes finishing the uncompleted work and ballasting. Track laying is to be carried out under the direction of the receiver. There will be one concrete bridge, for which contract has been let. (March 26, p. 726.)

INTERSTATE RAILWAY (ELECTRIC).—The Read Construction Co., Commerce building, Kansas City, Mo., wants to hear from grading contractors at once for work on the proposed electric line from Kansas City, Mo., to St. Joseph. (Sept. 24, p. 563.)

LAKE SHORE & MICHIGAN SOUTHERN.—An officer writes denying the reports that extensive double-tracking work is to be carried out on that road. The company is replacing some of the track with heavier rail, but are not contemplating any very extensive tracking on the high grade portion of the line at the present time.

LANSING & JACKSON.—See Michigan United Railways.

LONDON & NORTHWESTERN (ELECTRIC).—Projected from London, Ont., west via Lobo Junction to Sarnia, about 65 miles, with a branch from Lobo Junction northwest to Grand Bend, 30 miles, and other branches, in all 115 miles. Surveys are partly made and some rights-of-way secured. Contracts for building the line are to be let early next year. W. G. Swan, chief engineer, London.

MEXICAN ROADS.—According to a consular report, the state legislature of Coahuila, Mex., has ratified the contract made by Governor Miguel Cardenas, of that state, with Edward Hartman, for building a line between the cities of Monclova, Coahuila and Chihuahua. Mr. Hartman may be addressed care of Governor Cardenas.

MICHIGAN & CHICAGO (ELECTRIC).—According to press reports this company has given a mortgage to the Chicago Title & Trust Co. to provide funds for building from Grand Rapids, Mich., south to Kalamazoo, about 50 miles. The line may eventually be extended southwest via Dowagiac to Chicago. Charles R. Goodale, president, and F. I. Griswold, secretary.

MICHIGAN UNITED RAILWAYS (ELECTRIC).—According to press reports the Northern Construction Co., building an extension under the name of the Lansing & Jackson, from Lansing, Mich., south to Jackson, 37.5 miles, will start work soon on an extension from Lansing northeast via Owosso to Saginaw, about 70 miles.

NEW IBERIA, ST. MARTIN & NORTHERN.—An officer writes that a general contract has been given to P. M. Johnston, Son & Allhands, of St. Elmo, Ill., for building from Port Barre, St. Landry parish, La., southeasterly to New Iberia, 47.5 miles. Some track has already been laid. Maximum grades are to be 0.2 per cent. and maximum curvature 3 deg. There is to be one draw span of 140 ft. F. M. Welch, president, New Iberia; R. J. Lockwood, chief engineer.

NORTHWESTERN PACIFIC.—According to press reports work has been authorized on the first section of 30 miles of the gap between Sherwood, Cal., and Pepperwood, on the Eureka line, which are 105 miles apart. It is understood that work will be pushed until the entire 105 miles is finished. (Sept. 18, p. 521.)

PACIFIC & EASTERN.—Contracts for building 32 miles between Medford, Ore., and Butte Falls, it is said, will be let at once. This is in addition to the contract recently let to Porter Brothers, of Spokane, for 20 miles from Eagle Point east. The Butte Falls Lumber Co. has a contract for ties and seven carloads of 70-lb. rail are at Medford. (Sept. 24, p. 564.)

PAN-AMERICAN.—See Pan-American Railroad of Central America.

PAN-AMERICAN RAILROAD OF CENTRAL AMERICA.—According to press reports J. M. Nelland, vice-president and general manager of the Pan-American Railroad, associated with capitalists who sold the Pan-American, operating 244 miles of railway in Mexico, to David E. Thompson, the United States ambassador in Mexico, is organizing this company to have a capital of $50,000,000. The plans call for a line from the Guatemalan frontier southeast to the Panama canal, 1,400 miles, with connections on the northern end to existing lines. It is said that work will be started in January, 1910, at La Union, Salvador, and it is expected that the entire line will be finished within seven years.

PENNSYLVANIA.—The two inner tubes B and C of the tunnel system, being constructed in connection with the New York terminal improvements under the East river from the Borough of Manhattan into Queens, were joined recently and are ready for the installation of roadbeds, tracks and the operating equipment. Similar work is already under way on tube D, and it is expected that the two sections of the remaining tube A will be connected in about a month. All four tubes may be ready for operation early next year. (Sept. 10, p. 479.)

RAWHIDE WESTERN.—An officer writes that the company is building a line from Rawhide Junction, Nev., to Rawhide, in Esmeralda county. Grading has been finished on 25.2 miles, but track-laying has not yet been started, except on a 700-ft. connecting switch with the Southern Pacific. Work suspended, but may be resumed this fall. C. W. Reed, president, and R. E. Tilden, chief engineer and manager, Rawhide, Nev.

ROME & OSCEOLA.—An officer writes confirming the report that work has been started on the first section of this line from Rome, N. Y., north to Osceola, 29 miles. The section from Rome north to Lee Center, about six miles, is to be finished this year and the rest of the line in 1910. Almost all the right-of-way has been secured. The line will reach a timber section of 100,000 acres. W. P. White, president, Utica, N. Y. (Sept. 24, p. 564.)

ST. LOUIS COUNTY BELT.—Incorporated in Missouri, with $300,000 capital, to build 30 miles in St. Louis county from the northwest corner of Jefferson Barracks Reservation, north and northwesterly to Ferguson, thence to O'Neill. The incorporators include J. D. Houseman, of St. Louis county; J. E. Hereford, T. H. Gallagher, B. H. Lay, W. C. Corder and E. M. Remnels.

SEWELL VALLEY.—An officer writes that work is nearing completion on the line being built from Meadow Creek, W. Va., on the Chesapeake & Ohio, through Montrado and Springdale to Raine, or Meadow Creek, about 21 miles. Track has been laid on seven miles. The work near New river is heavy, maximum grades will be 3 per cent. and maximum curvature 16 deg. Morasco & Pasqualichis Co., of Johnsonburg, Pa., are the contractors for some of the work. T. W. Raine, president, Evenwood; J. M. Raine, chief engineer, Meadow Creek. (March 19, p. 615.)

SKAGIT-CASCADE & CHELAN.—Incorporated in Washington, with $25,000,000 capital, to build three lines as follows: Rockport, Wash., in Skagit county, up the Skagit river, east, thence northeast and north through Whatcom county to the British Columbia line; Marblemount, Skagit county, at a junction with the Skagit river line, up the valley of the Cascade river, east, thence southeast and northeast through Cascade Pass, in the Cascade mountains, by a tunnel at an elevation of about 2,800 ft., thence down the Stehekin river valley in Chelan county, southeast to the head of Lake Chelan at Stehekin, thence eastward to Spokane; from the junction of Thunder creek with the Skagit river, in Whatcom county, on the Skagit river line, south and southeasterly to Skagit county, in Silver basin, thence through the Cascade mountains by a tunnel under Boston Peak to Horse Shoe basin at an elevation of about 3,500 ft. to a connection with the Stehekin river line in Chelan county. The trustees include I. W. Shenk, of Los Angeles, Cal.; George Senor, W. E. Everette, C. E. Phoenix, A. M. Richards and W. W. Shenk, all of Tacoma; G. Shaw and T. W. Armitage, of Huddersfield, England.

TEXAS ROADS (ELECTRIC).—According to press reports the plans have been finished for the proposed Galveston-Houston electric line, which is being backed by the Stone & Webster interests of Boston, Mass. The line is to be laid with 85-lb. rail, it will be 43 miles long and cost $2,500,000. Entrance is to be secured into Galveston over the new causeway. (Jan. 1, p. 36.)

TUM TUM MOUNTAIN RAILWAY OF VANCOUVER (ELECTRIC).—Incorporated in Washington to build from Ridgefield, Wash., northeast via Lacenter to Tum Tum mountain. The incorporators include A. Arontson and J. Mener.

VANCOUVER, VICTORIA & EASTERN.—See Great Northern.

Railroad Financial News.

ALASKA CENTRAL.—The property of this company, which has a line in operation running northward from Seward, Alaska, about 50 miles, and has projected a line from Seward to Tanana river, 460 miles, is to be sold at auction on October 9 for the benefit of creditors.

BANGOR RAILWAY & ELECTRIC.—A quarterly dividend of 1½ per cent. has been declared, payable October 1, on the outstanding $1,500,000 capital stock. This places the stock on a 6 per cent. annual basis, comparing with 5 per cent. paid annually since October 1, 1905.

CENTRAL OF NEW JERSEY.—See Lehigh Valley.

GEORGE'S CREEK & CUMBERLAND.—See Western Maryland.

LEHIGH VALLEY.—The price of this company's stock, par value $50, advanced from $96 to $113 on the Philadelphia Stock Exchange during the past two weeks, and it is reported that the Reading company and the Central of New Jersey have sold their holdings of Lehigh Valley stock. The Reading held 20,000 shares and the Central of New Jersey 32,000 shares on June 30, 1908.

NEW ORLEANS & NORTHEASTERN.—An annual dividend of 5 per cent. has been declared. In 1908, 4 per cent. was paid; in 1907, 6 per cent., and in 1906, 5 per cent. In 1903 and 1904, 3 per cent. was paid annually. This is one of the roads forming part of what is known as the Queen & Crescent.

NEW YORK, NEW HAVEN & HARTFORD.—Stockholders are to vote on October 26 on authorizing the issue from time to time of $40,000,000 new stock. It is reported that stockholders and holders of convertible bonds will be given the privilege of subscribing in the near future at 125 for part of this new issue. The company has the following bonds falling due in 1910: $3,550,000 three-year 5 per cent. debenture notes due in January, $200,000 Short Line Railway 4½ per cent. mortgage bonds due in March, $100,000 Housatonic 4 per cent. first mortgage bonds due April 1, and $100,000 Woonsocket & Pascoag 5 per cent. first mortgage bonds due October 1. These bonds, totaling $3,950,000, have all been assumed by the New Haven company.

NEWPORT & WICKFORD RAILROAD & STEAMBOAT CO.—The property of this company, which owns a railway running from Wickford Junction, R. I., to Wickford Landing, 3.4 miles, and has outstanding $75,000 stock, is to be sold at auction on October 28 under foreclosure of the $100,000 mortgage dated 1891.

OREGON ELECTRIC.—Moffat & White, New York, are offering $2,000,000 first mortgage 5 per cent. bonds of 1908-1933 of the Oregon Electric Railway at 96½, yielding about 5.25. These bonds are secured by a first mortgage on the interurban electric railway running from Portland, Ore., to Salem, 70 miles. The company has outstanding $400,000 of an authorized issue of $5,000,000 6 per cent. cumulative preferred stock and $1,950,000 of an authorized issue of $5,000,000 common stock. The $2,000,000 bonds now offered are the only bonds so far issued of a total authorized issue of $10,000,000 bonds.

READING CO.—See Lehigh Valley.

THIRD AVENUE (NEW YORK).—See an item in regard to this company under State Commissions.

VICKSBURG, SHREVEPORT & PACIFIC.—A dividend of 5 per cent. has been declared on the $2,142,800 outstanding preferred stock. From 1902 to 1907 the full 5 per cent. dividend was paid on the preferred stock, but in 1908 no dividend was paid.

WESTERN MARYLAND.—The first mortgage bonds of the George's Creek & Cumberland, matured October 1, 1909, are being paid with interest at the office of the Mercantile Trust Co., New York. Last April the receiver of the Western Maryland sold $1,250,000 receiver's certificates, sufficient of the proceeds of which was reserved to pay, in connection with the sinking fund, the entire issue of the George's Creek & Cumberland first mortgage bonds.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The New York, Ontario & Western is in the market for three locomotives.

The Arkansas, Louisiana & Gulf has ordered one 10-wheeler from the American Locomotive Co.

The Pere Marquette has ordered 12 consolidation locomotives from the American Locomotive Co.

The North & South Carolina has ordered two 10-wheel locomotives from the Baldwin Locomotive Works.

The Northern Pacific has ordered 14 additional Pacific locomotives from the Baldwin Locomotive Works.

The Che-Kiang Railway, China, has ordered one eight-wheel locomotive from the American Locomotive Co.

The Western Railway of Minas, Rio de Janeiro, Brazil, has ordered four consolidation locomotives from the American Locomotive Co.

The Chicago, Burlington & Quincy has ordered 15 compound, mallet articulated locomotives from the Baldwin Locomotive Works, as mentioned in the *Railroad Age Gazette* of September 10. Five of the number have slightly different specifications from the rest, as shown in the following table:

General Dimensions.

	10 locomotives.	5 locomotives.
Weight on drivers	322,000 lbs.	316,000 lbs.
Total weight	362,500 "	355,000 "
Cylinders	21½ and 33 x 32 in.	21⅛ and 33 x 32 in.
Diameter of drivers	56 in.	56 in.
Type of boiler	Belpaire.	Belpaire.
Working steam pressure	200 lbs.	200 lbs.
Heating surface, tubes	5,375 sq. ft.	5,202 sq. ft.
" " firebox	225 "	230 "
" " total	5,600 "	5,432 "
Tubes, number	...	441
" outside diameter	...	2¼ in.
" length	...	21 in.
Firebox, length	120 in.	117 in.
" width	78¼ in.	77 and 80 in.
Grate area	65.2 sq ft.	78 sq. ft.
Tank capacity for water	8,000 gals.	8,000 gals.
Coal capacity	13 tons.	13 tons.

The Norfolk & Western, as mentioned in the *Railroad Age Gazette* of September 10, has ordered six simple Pacific locomotives from the American Locomotive Co. for delivery in November and December.

General Dimensions.

Weight on drivers	165,000 lbs.
Total weight	247,000 "
Cylinders	22½ in. x 28 in.
Diameter	70 "
Type of boiler	Radial stay. wagon top
Working steam pressure	200 lbs.
Heating surface, tubes	4,010 sq. ft.
" " firebox	157 "
" " total	4,167 "
Tubes, number	About 381
" outside diameter	2 in.
" length	20 ft. 1 "
Firebox, type	Semi-wide
" length	99⅞ in.
" width	64¼ "
" material and maker	Carbon steel
Grate area	45 sq. ft.
Tank capacity for water	8,000 gals.
Coal capacity	14 tons

Special Equipment.

Axles	Steel
Boiler lagging	Magnesia, sectional
Brakes	Westinghouse
Brake-beams	Deck beam, on tender
Brake-shoes	Perfecto
Driving boxes	Cast iron
Fire door	Franklin pneumatic
Headlight	Pyle electric
Injector	Monitor
Journal bearings	Brady
Piston and valve-rod packings	U. S. Metallic
Safety valve	Ashton
Sanding devices	Leach
Sight-feed lubricators	Nathan
Springs	Union Spring & Mfg. Co.
Staying	Part flexible
Steam gages	Ashton
Steam heat equipment	Gold
Tires	Latrobe
Tubes	Seamless steel
Valve gear	Baker-Pilliod
Wheel centers	Cast steel, driving and trailing

The Little River Railroad is said to have ordered one 75-ton locomotive from the Lima Locomotive & Machine Co. This item is not yet confirmed.

The Cumberland & Pennsylvania is said to be building three consolidation locomotives at its Mt. Savage, Md., shops. This item is not yet confirmed.

CAR BUILDING.

The Great Northern is in the market for 125 passenger cars.

The Chesapeake & Ohio is in the market for steel passenger cars.

The New York, Ontario & Western is in the market for eight passenger cars.

The Chicago, Milwaukee & St. Paul is asking bids on 178 passenger cars.

The Virginian Railway is in the market for eight passenger cars and about 10 cabooses.

The Chicago & Milwaukee Electric is in the market for 20 cars and one snow sweeper.

The Harriman Lines have ordered 815 fifty-ton, steel underframe, Hart convertible cars.

The Missouri Pacific has ordered 58 fifty-ton, steel underframe, Hart convertible cars.

The Birmingham Southern is in the market for 80 coke, 10 flat, 10 hopper and 10 box cars.

The Richmond, Fredericksburg & Potomac is in the market for three wooden passenger cars.

The Colorado & Southern has ordered 15 fifty-ton, steel underframe, Hart convertible cars.

The Indianapolis, New Castle & Toledo has ordered eight electric cars from the Jewett Car Co.

The Atchison, Topeka & Santa Fe has ordered 33 cabooses from the American Car & Foundry Co.

The Harriman Lines have ordered from the Pullman Co. 15 all-steel chair cars. The specifications will be the same as for those mentioned in the *Railroad Age Gazette* of July 16.

The Chicago, Burlington & Quincy has ordered 1,000 stock cars from the Mt. Vernon Car Co. as mentioned in the *Railroad Age Gazette* of September 10. Delivery is set for October and November. The cars are of 30 tons capacity, are all-wood, and have the following dimensions: Length, 36 ft. 1⅝ in.; width, 8 ft. 7⅜ in. inside; length, 37 ft. 9 in., and width, 9 ft. 4 in., over all.

IRON AND STEEL.

The Missouri Pacific has ordered 25,000 tons of rails.

The Chicago, Milwaukee & St. Paul has ordered 75,000 tons of rails.

The Pennsylvania has ordered 200,360 tons of rails for 1910 requirements.

The Grand Trunk is asking prices on 7,500 tons of rails for delivery next year.

The New York Central Lines are preparing specifications for 1910 rail requirements.

The Hocking Valley is in the market for 250 tons of structural steel for several small bridges.

The Michigan Central is in the market for 4,500 tons of steel for the Detroit subway and station.

The Baltimore & Ohio is in the market for 2,000 tons of structural steel for a number of bridges.

The Lake Shore & Michigan Southern is in the market for 1,700 tons of plates and shapes for its ore docks in Ashtabula, Ohio.

The Northern Pacific has ordered from the Minneapolis Steel

& Machinery Co. 800 tons of structural steel for its station at Tacoma, Wash.

The Houston Belt & Terminal Ry. has ordered from the American Bridge Co. 1,200 tons of structural steel for its station at Houston, Tex.

General Conditions in Steel.—The greatest demand is for rails and steel sheets. There is a good demand for plain structural material, and the market for fabricated steel is irregular. It is believed that the September output of steel will be greater than the August production, and that October will be larger than all previous records in the output of steel ingots and many finished products. It is estimated that the rail production of the country in 1910 will reach 4,500,000 tons, which would be nearly 1,000,000 tons greater than 1907 and 500,000 tons greater than the record year of 1906. Bessemer iron is quoted at about $18.50, and is expected to rise higher. Chairman Gary, of the United States Steel Corporation, in an interview said that the corporation had no intention of forcing higher prices for steel.

RAILROAD STRUCTURES.

BAY ST. LOUIS, MISS.—The long bridge of the Louisville & Nashville over the entrance of St. Louis bay is said to have been destroyed by recent floods, with the exception of the draw in the center.

BELLEFONTAINE, OHIO.—The Cleveland, Cincinnati, Chicago & St. Louis is installing a boiler-washing plant in its roundhouse to utilize the steam in engines that is brought into the house.

BENWOOD, W. VA.—The Baltimore & Ohio has just given contracts to the Patrick Farrell Construction Company, of Cincinnati, Ohio, for extensive shop improvements at Benwood, W. Va., to cost $150,000, and which will mean the rebuilding of all the Benwood shops. The improvements include: 23-stall engine house, with turntable and pit 80 ft. long; oil house, 30 ft. x 58 ft.; storehouse, 30 ft. x 70 ft., with platform 20 ft. x 30 ft.; machine shop, blacksmith shop, boiler and engine rooms, 60 ft. x 184 ft., with brick stack 125 ft. high; sand house, 22 ft. x 94 ft., with tower 13 ft. x 15 ft.; carpenter shop, 35 ft. x 82 ft.; material storage platform, 25 ft. x 90 ft.; shaving shed, 12 ft. x 33 ft.; casting storage platform, 38 ft. x 60 ft.; pipe, bar iron and sheet metal storage racks, 20 ft. x 38 ft.; two scrap bins, 20 ft. x 42 ft. and 20 ft. x 70 ft., respectively; locomotive cleaning platform, 19 ft. x 75 ft. There will be installed a new system of water supply and fire protection, also a complete sewerage system. The larger buildings will be of brick and concrete construction. Work will be begun at once and it is expected that the shops will be completed by February 1, 1910.

BIRMINGHAM, ALA.—The Birmingham Railway, Light & Power Co. is to build a brick freight house which will cost about $12,000.

CHANNING, TEX.—The Fort Worth & Denver City will rebuild the bridge over the Canadian river that was washed out in the recent floods.

CHICAGO.—The contract has been let to Geo. W. Jackson, Inc., Chicago, for the Chicago Railways Co.'s tunnel under the south branch of the Chicago river on Washington street. The old tunnel is to be enlarged and lowered to carry the west side surface lines, and may serve as a part of a subway system in the future.

EAST SOMERVILLE, MASS.—See Boston & Maine under Railroad Construction.

FITCHBURG, MASS.—See Boston & Maine under Railroad Construction.

GALVESTON, TEX.—The Gulf, Colorado & Santa Fe expects to build an 18-stall roundhouse, a machine shop and new car repairing sheds.

An officer writes that the contract for the Somerville roundhouse and turntable has been let to McCoy & Green, Cleburne, Tex., and that work will begin in a few days. Work on the roundhouse and turntable at San Angelo is held up awaiting prospective changes in location.

HOQUIAM, WASH.—Arrangements are said to have been made between the Harriman Lines and the city officials to build a lift bridge at a cost of $225,000 over the Hoquiam river at Simpson avenue.

JACKSON, TENN.—Press reports say that the Nashville, Chattanooga & St. Louis will build a passenger station.

LIMA, OHIO.—The Ohio Electric Railway has given a contract to Val Heil, of Lima, for putting up a passenger terminal station of brick, concrete and steel construction, two stories high. Work is to be started at once. The cost of the improvement, including site for the station, is $75,000.

LOUISVILLE, KY.—The Louisville Railway is building an addition to its power plant, 110 ft. x 60 ft., one story high. The cost of the improvement, including the machinery to be installed, will be about $70,000.

MARSHALL, TEX.—The Marshall & East Texas is planning to build shops in the near future.

MILFORD, MICH.—The Pere Marquette is replacing a pile trestle over Commerce street with a permanent bridge.

MT. PLEASANT, TEX.—The St. Louis Southwestern has bought a site upon which to build a station and office building. It will be two stories high, of pressed brick, and cost $75,000.

PENSACOLA, FLA.—The Louisville & Nashville will build a trestle over the Bayou Texar, to cost $50,000.

SAN DIEGO, CAL.—The Atchison, Topeka & Santa Fe expects to build two freight houses and additional yard tracks to cost $250,000.

SHEPHERDSVILLE, KY.—The Louisville & Nashville has begun work, according to local press reports, on a double-track bridge over the Salt river.

STAMFORD, TEX.—See Stamford & Northwestern under Railroad Construction.

TACOMA, WASH.—The City Council has given a franchise to the Oregon & Washington to cross Pacific avenue over a steel viaduct and along Fifteenth street and across the city waterway. The company is to build a highway bridge under the railway bridge to its freight sheds on the tide flats. Work is to be started in about six months. It is expected that it will take about two and one-half years to finish the improvements.

SIGNALING.

The electrified section of the Harlem division of the New York Central now extends from the Grand Central station, New York, to Wakefield, about 12 miles. The electrification is to be extended 10 miles further to North White Plains, and in connection with this the automatic block signaling is to be made uniform throughout, and the company is to install north of Wakefield 30 of the General Railway Signal Company's semaphores, model 2-A. These signals will give the indications in the upper right-hand quadrant and will be three-position. As on the electrified section south of Wakefield, the signals wil be operated by alternating current.

The New York, New Haven & Hartford is erecting automatic block signals on the line between New Rochelle and Harlem River, N. Y. This line, formerly two-track and hitherto worked by the controlled manual block system, is now a six-track line, four tracks being used for passenger trains and two for freight. The length of the line is 12 miles. The new signals are two-position and will be suspended from signal bridges, each location to have a home and a distant signal. The apparatus will be the General Railway Signal Company's model 2-A. There will be on this line two mechanical interlocking plants and three all-electric interlockings. Alternating current will be used in the entire installation; for the operation of the signals, for the track circuits and for the lights in the signals; also for the approach locking and the approach indication circuits at the interlocking stations.

Supply Trade News.

The Virginian Railway has issued inquiries on a list of about 25 machine tools.

The Alexander Milburn Co., Baltimore, Md., maker of portable acetylene lights, reports that business is steadily reviving.

The directors of the Union Switch & Signal Co., Swissvale, Pa., have declared the regular quarterly dividends of 3 per cent. on each class of stock.

The Chicago office of John Lucas & Co., Philadelphia, Pa., has been moved to 750 Old Colony building. Harry C. Quest is the manager of the railway sales department.

The Indianapolis, New Castle & Toledo Electric Railway has ordered from the General Electric Co., Schenectady, N. Y., two 1,500-k.w. horizontal 25-cycle, three-phase turbines and equipment for three rotary sub-stations.

The Atchison, Topeka & Santa Fe recently ordered a second locomotive pile driver from the Bucyrus Co., South Milwaukee, Wis. The first machine of this type was built by that company for the Santa Fe in January of this year.

The Culver & Port Clinton Railroad, Chicago, recently ordered a 14-in. x 22-in. double-ender saddle-tank locomotive from the Vulcan Iron Works, Wilkesbarre, Pa. This engine will be placed in operation at the Gibson, Ohio, station.

The Lackawanna Bridge Co., Lackawanna, N. Y., has ordered a number of punches from Joseph T. Ryerson & Son, Chicago. It was incorrectly stated in last week's issue that this order was placed with the Cleveland Punch & Shear Works, Cleveland, Ohio.

The Lake Shore & Michigan Southern has ordered four 15-ton Hulett unloaders from the Wellman-Seaver-Morgan Co., Cleveland, Ohio, for the Ashtabula ore docks. The same company is expected to buy a Hoover & Mason ore bridge and equipment for a power plant which will be erected at the dock.

Henry T. Leach, inventor of the Leach locomotive sander, and who has for many years been in the railway and railway supply business, has gone to the Ehret Magnesia Manufacturing Co., Philadelphia, Pa. He will be in charge of the railway department, with headquarters at the main office of the company, Land Title building, Philadelphia.

George Callahan & Co., New York, report increasing railway sales of their non-corrosive non-poisonous soldering fluid. The claims for this fluid are that it is of extra strength, makes filing of irons unnecessary, makes smooth, clean joints and is far superior to acid, being much cleaner and having none of the disadvantages of acid and other fluids. This firm, which has among its customers 400 railways, also makes Old Reliable front end cement, Anti-Slip belt dressing and elastic roof coating for leaky roofs.

Orders for direct-current apparatus recently received by the Crocker-Wheeler Co., Ampere, N. J., include one from the Southern Iron & Steel Co., Roger, Ga., for two 250-k.w., engine-type, 550-volt generators, and 275-h.p. in 500-volt motors. This is in addition to a recent order for 1,450-k.w. in engine type generators and 1,200 h.p. in slow-speed motors for the same concern. The Republic Iron & Steel Co., Youngstown, Ohio, placed an order for a 600-k.w., engine-type, 250-volt, direct-current generator, which will be added to a plant consisting of two 300-k.w. Crocker-Wheeler generators.

The Handlan-Buck Manufacturing Co., St. Louis, Mo., recently closed a contract with the Waterloo Drop Forge Co., Waterloo, Iowa, for furnishing that company a complete drop forge equipment, with the exception of the drop hammers, including 135 h.p. in electric motors, power presses, lathes, planers, millers, shapers, drills and miscellaneous tools, amounting to approximately $25,000. The machine shops and forge room will be lighted with Stave flaming arc lamps, for which the Handlan company is western agent. John R. Morris is president and general manager of the Waterloo company and F. B. Johnson is superintendent. The company will engage in the general drop forge business and will make high grade tools on which it has secured a number of patents.

TRADE PUBLICATIONS.

Unloading Plows.—The Bucyrus Co., South Milwaukee, Wis., has issued a catalogue describing its latest designs in unloading plows. Center and side unloaders are both illustrated and four sizes of each are listed.

Foundry Facings.—The Joseph Dixon Crucible Co., Jersey City, N. J., has published a small pamphlet describing graphite facings for application to the surface of molds to prevent adhesion between the metal and the sand. Prices of different varieties are given.

Portable Lights.—A pamphlet issued by the Alexander Milburn Co., Baltimore, Md., describes, with illustrations and price lists, a number of styles of portable acetylene lights in sizes up to 10,000 candle power. They include small hand lights of 50 candle power. Testimonials and a partial list of customers are given in the pamphlet.

Vertical Engines.—The American Blower Co., Detroit, Mich., is distributing a little folder containing facsimiles of some of the letters and record cards received in reply to a request from the company for records of the service given by the type A, vertical, self-oiling, engine. The records are accompanied by photographs of the installations.

Furnaces.—A 40-page catalogue issued by the Rockwell Furnace Co., New York, gives fully illustrated descriptions of a number of small and large forging, heating and welding furnaces for either hand or machine work. Portable heaters, gas and oil burners, blowers for furnace work, fuel oil pumping systems and other accessories are also shown.

Electric Drills, Etc.—A 42-page catalogue issued by the S. Obermayer Co., Cincinnati, Ohio, illustrates and describes a variety of portable electric tools, including chipping hammers, drills, reamers, grinders, buffers and blowers for removing dust from the crevices in machinery. All these tools are furnished in both direct-current and alternating-current types.

Magnesia.—The Ehret Magnesia Manufacturing Co., Philadelphia, Pa., has published a price list of its 85 per cent. magnesia and other sectional and plastic coverings. These products include magnesia sectional blocks, sectional pipe coverings and fittings for various pipe joints, the Hercules dead air space coverings, corrugated asbestos paper, asbestos air cell sectional covering and board, asbestos block covering, wool felt covering, etc.

The Reform Movement.

When the engineers were locating the Anatolian Railway on the sea of Marmora, opposite Constantinople, they found the country overrun by bands of Circassian robbers under a chief who is now station master at an important station on a salary of $500 a year, respected by the community—an example of the civilizing influence of railways.

Training Railway Men for Promotion.

The railway department of the International Correspondence Schools, Scranton, Pa., was organized in 1898 to teach practical locomotive enginemen, locomotive firemen, conductors, trainmen, switchmen, car inspectors, air-brake inspectors car repairers, and roundhouse employees the safe and economical operation of the mechanism placed in charge of these men.

Special courses of instruction were written, all care being taken to make them practical and such as to meet the requirements. In conjunction with these courses, seven locomotive and air-brake instruction cars were placed in commission. As new equipment is adopted by the railway companies, these cars are equipped with facilities for demonstrating its construction and operation to the employees. In addition to the instruction cars, the railway department established at Chicago a modern and thoroughly furnished locomotive instruction plant. A portion of the equipment is as follows: 47 freight brakes in actual operation; 6 passenger car brakes with high speed attachment; air signaling equipment for a 10-car train; operative and sectional models working in tandem; the latest E. T. Westinghouse air-

brake apparatus; complete engine equipment for all the above; sectionals of all makes of injectors; sectionals of all makes of lubricators; models of Stephenson link motion; models of Walschaerts valve gear; models of compound engines; facilities for teaching economical and practical methods of firing locomotives; specially prepared views to teach valve motion; special views showing breakdowns and repair matters; study rooms for students; lecture rooms for classes.

The plant is used exclusively for the instruction of practical railway employees. In the selection of instructors care is exercised to secure competent men equipped with practical experience. The instruction cars move over the railways of the United States, Canada and Mexico, and all employees of railways with which the schools have arrangements are given free instruction whether they hold scholarships with the schools or not.

In connection with the railway department, the International Correspondence Schools have also constructed two dynamometer cars. Car Scranton is a passenger train dynamometer and speedometer car. Drawbar pull, speed of train, distance, steam pressure, fuel consumed and handling of engine and brakes are automatically and accurately recorded. Car No. 300 is a dynamometer car of improved design, used in freight service. It is strongly constructed and can be used to test hauling capacity of the largest engines in service.

The railway department has special arrangements with over 200 roads throughout the United States, Canada and Mexico. In a single month, June, 1909, notwithstanding the hot weather, there were 234 different classes held in its cars and instruction rooms, at which there was a total attendance of 5,642 railway employees.

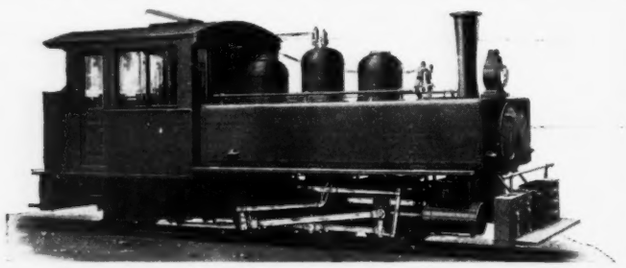
Communications relative to the work should be addressed to W. N. Mitchell, general manager, railway department, 5037 Cottage Grove avenue, Chicago.

Plate Glass.

A great deal has been said and written of late on the subject of suitable glass for passenger equipment. Anyone who has investigated the matter realizes fully that polished plate glass is far superior to sheet glass. The latter, in the course of manufacture, is blown in cylinder form, then divided and flattened, the result being that the sheets are more or less bowed and the surface very uneven. Plate glass is cast and rolled, then ground to a true surface, after which it is highly polished. This results in a product which is strong and permits of clear vision.

Locomotives for Construction on Chilean State Railways.

The accompanying cut shows one of the two locomotives recently shipped by the Davenport Locomotive Works, Davenport, Iowa, to Lezaeta Duran Hermanon & Co., Santiago de Chile. This company is engaged in railway contracting, and the locomotives are intended



for construction work, although at a later date they are to be used in regular service on the Chilean State Railways.

They are of the side tank, six-coupled trailing type, weighing 34,000 lbs. on the drivers and 40,000 lbs. total. They have a rigid wheel base of 6 ft. and a total wheel base of 13 ft. 6 in., gage 60 centimeters (23⅝ in.), tractive effort 5,320 lbs. They are equipped with Richardson balanced slide valves and Walschaerts valve gear, and have the following general dimensions:

Cylinders	9 in. x 14 in.
Diameter of drivers	29 in.
Type of boiler	Straight top
Working steam pressure	160 lbs.
Heating surface, tubes	239.4 sq. ft.
" " firebox	35.4 "
" " total	274.8 "
Tubes, number	52
" outside diameter	2 in.
" length	105½ in.
Firebox, length	42 in.
" width	22¼ in.
Grate area	6.5 sq. ft.
Tank capacity for water	665 gal.
Coal capacity	2,200 lbs.

Hydro-Carbon Burner.

Wherever Pintsch gas is manufactured for railways there is a great quantity of refuse, which is commercially called hydro-carbon.

The accompanying illustrations show burners in actual operation with hydro-carbon. Fig. 1 shows one at work heating corners of a

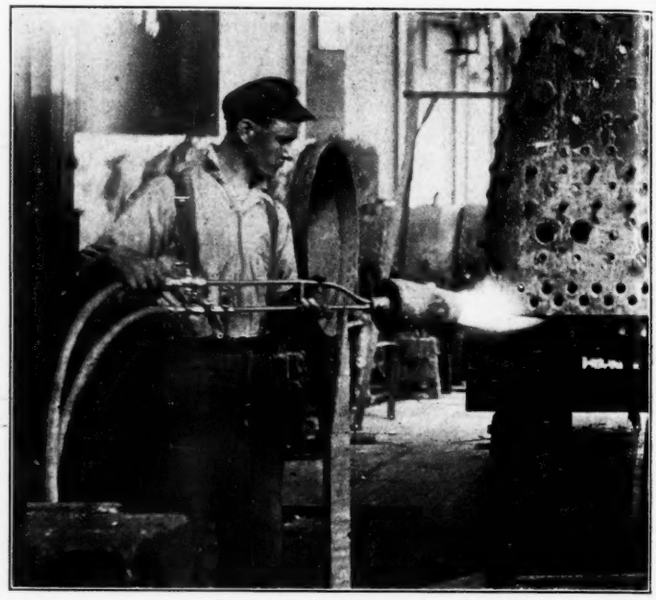


Fig. 1—Houck Burner on Boiler Work.

locomotive boiler. Fig. 2 shows the heating of a locomotive frame for straightening. The bricks near the flame of the burner are used for confining the heat to the proper spot.

This burner makes a very clear flame. The construction is simple and reliable and can be handled safely by any workman. An important feature is that the burner can be changed with a slight alteration so that any liquid fuel can be successfully used with it.

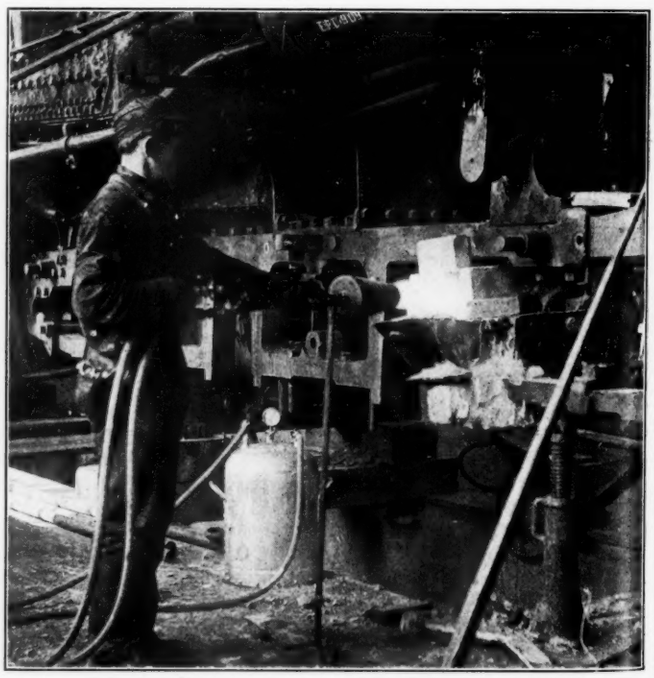


Fig. 2—Houck Burner Heating Locomotive Frame.

This machine is particularly adapted to work in constructing and repairing steel cars and straightening and welding engine frames. It can also be successfully used for preheating in connection with thermic welding, making and repairing boilers, brazing and various other heating operations.

The maker is the Hauck Manufacturing Co., New York.